FOREIGN DIRECT INVESTMENT: CAUSES AND CONSEQUENCES

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The determinants of inward and outward FDI and their relationship with economic growth

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Abstract

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This thesis complements current studies by focusing on developed OECD countries as they are the major sources and recipients of world FDI and current studies relating to developed countries using aggregate country FDI data are limited. This study empirically tests the determinants of FDI inflows and outflows and their relationship with economic growth using 2SLS simultaneous equations model between 1981 and 2008 for a sample of 20 developed OECD countries. The empirical findings suggest that FDI inflows do not contribute to economic growth in the host country and economic growth positively affects FDI inflows. In addition, trade openness and flexible employment protection legislation in the host country attract FDI inflows. In terms of FDI outflows, the results show that FDI outflows reduce economic growth in the home country, while economic growth in the home country increases FDI outflows. Moreover, high past level of outward FDI stock, trade openness, low labour cost and currency depreciation in the home country provide incentives for domestic firms to invest abroad. Therefore, this study does not support offering special incentives to foreign investors to attract FDI inflows or offering promotional policies to domestic firms to encourage FDI outflows. Instead, government should provide incentives for domestic investment and other sound policies to increase economic growth, which in itself provides a good environment to attract FDI inflows and to encourage FDI outflows.

Keywords: FDI inflows, FDI outflows, two stage least squares simultaneous equations, economic growth, labour market flexibility

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List of abbreviations

2SLS: Two Stage Least Squares

AIC: Akaike's Information Criterion

EC: European Community

ECM: Error Correction Model

EU: European Union

FDI: Foreign Direct Investment

FPE: Final Prediction Error

GDP: Gross Domestic Product

GLS: Generalized Least Squares

HQIC: Hannan-Quinn Information Criterion

ILO: International Labour Organization

IMF: International Monetary Fund

IV: Instrumental Variable

LR: Likelihood Ratio

M&As: Mergers and Acquisitions

MNE: Multinational Enterprise

NOI Position: Net Outward Investment Position

OECD: Organization for Economic Cooperation and Development

OLI Advantages: Ownership, Location and Internalization Advantages

OLS: Ordinary Least Squares

R&D: Research and Development

SBIC: Schwarz's Bayesian Information Criterion

UK: United Kingdom

UKTI: UK Trade & Investment

UNCTAD: United Nations Conference on Trade and Development

US: United States

VIF: Variance-Inflation Factor

1 Introduction

FDI plays an important role in influencing the level of economic activity in the world with multinational companies accounting for above one-fifth of world employment in the non-agricultural sectors (Whyman *et al.*, 2008). The remarkable growth in FDI has attracted the attention of many researchers on developing countries, as they believe that developing countries have less advanced technology and benefit more from inward FDI through technology spillover (Bengoa and Sanchez-Robles, 2003; Roy and Van den Berg, 2006). However, developed countries might also benefit from inward FDI. For example, take the UK where at the UK Trade & Investment (UKTI) Business Summit in 2010, Business Secretary, Vince Cable, stated that inward FDI brings new technology and good management practice, creates jobs and stimulates economic growth. Whilst Prime Minister David Cameron also emphasized that UK needs to maximize the amount of inward FDI in order to recover from recession and promote economic growth.

In 2009/2010, the UK had 1,619 foreign direct investment projects from 54 countries, which created more than 53,000 new jobs, safeguarded over 40,000 further jobs and brought significant added value to the UK's economy (UKTI, 2010). For example, the automotive sector is of key importance to the UK, whereby the Japanese automotive company Nissan employs over 4,000 people in its Sunderland factory, which is the largest car factory and the biggest exporter in the UK. In March 2010, Nissan decided to build its new electric Leaf car at the Sunderland plant from 2013, which will secure 4,500 jobs and create up to 20,000 jobs in the region's supply sector (Massey, 2010; Madslien, 2010). Similarly, Swindon once relied on the Great Western Railway works, which employed around 14,000 people, but shut its operations in 1980s. Thereafter, Honda built a manufacturing plant in Swindon, which has become the main employer

and the key driver in its economy (Young, 2009). Therefore, inward FDI is a key factor in creating jobs and achieving economic growth even in developed countries. However, there is a risk that inward FDI may transfer the host country's advanced technology to the home country, resulting in a reduction in the comparative advantage of the host country (Dunning, 1994). Another potential drawback is that foreign firms might outcompete local firms and drive them out of business. (Blomstrom and Kokko, 1997; Hill, 2009).

Outward FDI may also bring significant benefits to the home country, with outward investing firms benefiting from increasing returns to scale and yielding higher profits by investing abroad than by investing in the home market (HM Treasury, 1996). The total earnings from outward FDI by UK companies in 2009 are approximately £69.6 billion (ONS, 2010), which can be reinvested in the UK, contributing to economic growth. Outward FDI may also provide routes to transfer advanced technology, management skills and working training to the home country, therefore improving the productivity of domestic firms (HM Treasury, 1996). However, concerns arise over the adverse impact of outward FDI on employment, domestic investment and exports in the home country. Outward investment might lead to a displacement in domestic investment, a reduction in employment and exports in the home country.

At the broader level, developed countries have been both the major sources and recipients of FDI (UNCTAD, 2006). The majority of FDI inflows into developed countries originated from other developed countries and the largest share of outflows from developed countries was directed towards other developed countries. However, the distribution of FDI flows in the developed countries has been uneven. Using the

measure of FDI as a percentage of total world FDI, the top 10 developed FDI host countries in 2008 were: US, Belgium, UK, Spain, France, Canada, Australia, Sweden, Japan, Switzerland, who received 49 percent of world FDI inflows (UNCTAD, 2011). The top 10 developed FDI home countries in 2008 were: US, Belgium, UK, France, Japan, Canada, Germany, Spain, Netherlands and Italy, who contributed 67 percent of world FDI outflows (UNCTAD, 2011). Therefore, identifying what host country factors attract inward FDI and what home country factors encourage outward FDI can help us understand the patterns of FDI in developed countries. At the 2010 UKTI Business Summit, both Prime Minister David Cameron and Business Secretary Vince Cable stressed that the UK needs to build a deregulated labour market and a strong R&D base in order to become a more attractive investment destination. According to the World Bank's assessment, the UK is ranked as the top in Europe and fifth in the world for "ease of doing business", which covers labour market flexibility (UKTI, 2010). In addition, the UK has a very strong R&D base, which is ranked as the strongest in Europe and the second strongest in the world (UKTI, 2010). Therefore, issues such as labour market flexibility and R&D expenditure are key to examining factors influencing inward/outward FDI.

Consequently, this thesis contributes to the existing literature in the following ways. First, this study considers a 'nation' as the unit for analysis and uses data on aggregate FDI inflows into a country from the rest of the world and aggregate FDI outflows from a country to the rest of the world. Second, this study concentrates on developed OECD countries (Australia, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK and US) as inward/outward FDI might be an important engine to their

economic growth and they are the major sources and recipients of FDI. This contrasts with the vast majority of empirical studies focusing on developing countries. Furthermore, many empirical studies pool both developed countries and developing countries into one sample and do not distinguish them in their analysis. Blonigen and Wang (2005) argue that FDI plays a different role in developed countries compared to developing countries such that pooling developed and developing countries in an empirical analysis leads to incorrect inferences. Third, this study empirically examines the host country factors that attract inward FDI, especially the effect of labour market flexibility. The number of current studies on the impact of labour market flexibility on inward FDI using country-level data are limited. Moreover, this study takes into consideration the importance of outward FDI on the host country's economy, which has been largely neglected in the literature. Hence, it analyses the determinants of outward FDI, particularly by looking at whether rigid labour market legislation has an impact on the decision of domestic firms to invest abroad. In addition, it empirically assesses whether inward/outward FDI positively contributes to economic growth. Finally, a Two Stage Least Squares (2SLS) simultaneous equations model is employed to take account of the interdependence between inward/outward FDI and economic growth, while the majority of current studies do not take the interdependence into consideration.

The thesis is organized in seven chapters. Chapter 2 will provide a brief discussion about the definition of FDI, types of FDI, FDI trends and FDI distribution. Chapter 3 will review the economic theories and empirical literature in relation to the determinants of inward and outward FDI and their relationship with economic growth. Regarding the empirical literature, this study surveys previous studies that employ aggregate country-

level FDI data and macroeconomic variables. In addition, this chapter will also present research approach and data collection method used in this study.

The time period for all data analysis is from 1981 to 2008. It starts from 1981 as one of the determinants of FDI – past level of FDI stock data is only available from 1981. It ends in 2008 as another determinant of FDI – employment protection legislation index is only available until 2008. Chapter 4 will examine the causal relationship between FDI inflows/outflows and the host/home country's economic growth. Based on the time-series causality test developed by Toda and Yamamoto (1995), we will analyse the causal links for twenty developed countries from 1981 to 2008 and will divide the countries into four groups – countries that experience FDI-led growth, countries that experience growth-led FDI, countries that experience bi-directional causality and countries that do not experience causality.

Based on the causality test results in Chapter 4, Chapter 5 will assess the determinants of FDI inflows/outflows in the above four country groups. In particular, we are interested in examining whether a country with flexible labour market systems receives more FDI inflows. In addition, this chapter will also look at whether a country with rigid labour market systems encourages more FDI outflows. In contrast to most previous studies that use firm-level, industry-level or bilateral FDI data, this study aims to make a contribution to the empirical literature on the determinants of FDI inflows/outflows by using aggregate country level data. Both fixed/random effect model and 2SLS model will be employed over the period 1981-2008.

Due to the limitations of methodologies and research design used in Chapters 4 and 5, Chapter 6 will pool all twenty developed countries into one sample and re-analyse the determinants of FDI inflows and outflows and their relationship with economic growth. Finally, Chapter 7 will draw together the key findings from the range of empirical work and will suggest possible future research.

2 FDI trends and distribution in developed OECD countries

2.1 Introduction

Current country level studies on the relationship between inward FDI and growth have focused on developing countries (Zhang, 2001; Campos and Kinoshita, 2002; Basu *et al.*, 2003; Lyroudi *et al.*, 2004; Makki and Somwaru, 2004; Lumbila, 2005; Sylwester, 2005; Hansen and Rand, 2006; Hsiao and Hsiao, 2006; Greenaway *et al.*, 2007; Qi, 2007; Duttaray *et al.*, 2008; Liu *et al.*, 2009), as they take the view that developing countries have less advanced technology and are technological laggards compared to developed countries (Roy and Van den Berg, 2006). Therefore, the role of inward FDI in transferring technology to developing countries is more important. In addition, many studies pool both developed and developing countries into one sample and do not distinguish them (Olofsdotter, 1998; de Mello, 1999; Ram and Zhang, 2002; Choe, 2003; Alfaro *et al.*, 2004; Durham, 2004; Le and Suruga, 2005; Busse and Groizard, 2006; Batten and Vo, 2009). Blonigen and Wang (2005) argue that significant differences exist in developed and developing countries and pooling data together leads to false inferences. However, the empirical studies on only developed countries are limited (Ericsson and Irandoust, 2001; Ekanayake *et al.*, 2003; Kottaridi, 2005; Roy and Van den Berg, 2006; Ghosh and Wang, 2009; Iyer et *al.*, 2009). In addition, studies on the impact of outward FDI on the home country's economic growth are relatively scarce (Herzer, 2008; Ghosh and Wang, 2009). Therefore, it is important to analyse FDI in developed countries and that is why this study focuses on developed OECD countries. Chapter 3 will discuss the empirical literature in details.

The objective of this chapter is threefold. First, this chapter seeks to define the concept of FDI and the different types of FDI. Second, it explains another important reason to

investigate FDI in developed countries by looking at the trends of FDI inflows and outflows for developed OECD countries, the proportion of world inflows into developed OECD countries and the proportion of world outflows from developed OECD countries. Finally, it looks at the distribution of FDI for each individual country to see whether FDI distribution is even among the group of developed OECD countries.

2.2 The definition of FDI

According to IMF (1993), FDI reflects a long-term relationship between a direct investor in one country and a direct investment enterprise in another country. The direct investor acquires 10 percent or more of the ordinary shares or voting power of the enterprise, therefore it plays a significant role in influencing the management of the enterprise. Although the 10 percent criterion is specified, subjective involvement is involved in some countries. If the direct investor owns less than 10 percent of the ordinary shares or voting power of the enterprise, but has an effective voice in management, the investment might be included as FDI. On the contrary, if the investor owns 10 percent or more of the ordinary shares or voting power, but does not have an effective voice in management, the investment might not be included as FDI.

There are three components of FDI – equity capital, reinvested earnings and inter-company debt transactions. Equity capital includes equity in branches, all shares in subsidiaries and associates, and other capital contributions such as provision of machinery. Reinvested earnings consist of the direct investor's share of earnings not distributed as dividends and earnings not remitted to the direct investor. Inter-company debt transactions comprise the borrowing and lending of funds between direct investors and subsidiaries, branches and associates.

2.3 The types of FDI

According to Dunning (1993), the main motives for a firm to engage in foreign production are to seek natural resources, to seek market, to seek efficiency and to seek strategic asset. FDI may be categorized into four types according to the motives of investing abroad.

2.3.1 Natural resource seeking FDI

A firm of a particular country invests abroad to get access to resources not available in the home country or to obtain resources at lower costs. Most output of foreign production is exported mainly to developed countries. There are three types of resources in a foreign country that a firm may want to acquire. The first type includes physical resources such as minerals, raw materials and agricultural products etc. This kind of investment involves significant capital expenditure and is location-bound. The second type of investment is prompted to seek cheap labour force in labour-intensive manufacturing and service sectors. Most locations of this type of investment are industrialized developing countries. In the third type, a firm carries out foreign production to acquire technology, information, managerial skills and so on (Dunning, 1993).

2.3.2 Market seeking FDI

Market-seeking FDI is investment which is undertaken in a foreign country in order to supply goods and services to the foreign market and the other markets in adjacent countries. There are a few reasons why multinational enterprises (MNEs) engage in market-seeking FDI. First, MNEs invest in a foreign country as their main suppliers have set up production facilities in that country. Second, MNEs undertake production abroad in order to adapt to local customers' tastes, business customs, legal requirements, marketing procedures and investment environment etc. Therefore, they are in a better

position to compete with local firms and to serve the local market. Another incentive might be that the production and transaction costs are lower. MNEs can exploit economies of scale in a foreign country with big market size. In addition, outward FDI may circumvent trade barriers imposed by the host country's government such as import controls. The final reason is that MNEs might view it as a global production and marketing strategy. MNEs can acquire strategy assets from its local and foreign competitors and enhance its competitive advantages (Dunning, 1993).

2.3.3 Efficiency seeking FDI

The efficiency seekers are usually large MNEs, which have investment experience in different cross-border activities. There are two kinds of efficiency seeking FDI. The motivation of the first one is to take advantage of different factor endowments in different countries such as natural resources, labour and technology. Investment in labour-intensive manufacturing industries and primary product industries tends to take place in developing countries, whereas investment in technology-intensive and information-intensive industries tends to takes place in developed countries. The purpose of the second one is to take advantage of economies of scale and scope, created assets and capabilities, the nature of consumer demand, the quality of supporting industries and the government policies etc. This kind of investment is likely to occur in countries with similar income levels and economic structures. In addition, as experienced investors, MNEs can benefit from the common governance of geographically dispersed activities such as cross-border risk diversification, process specialization, arbitraging cost, price differentials due to exchange rates and so on (Dunning, 1993).

2.3.4 Strategic asset seeking FDI

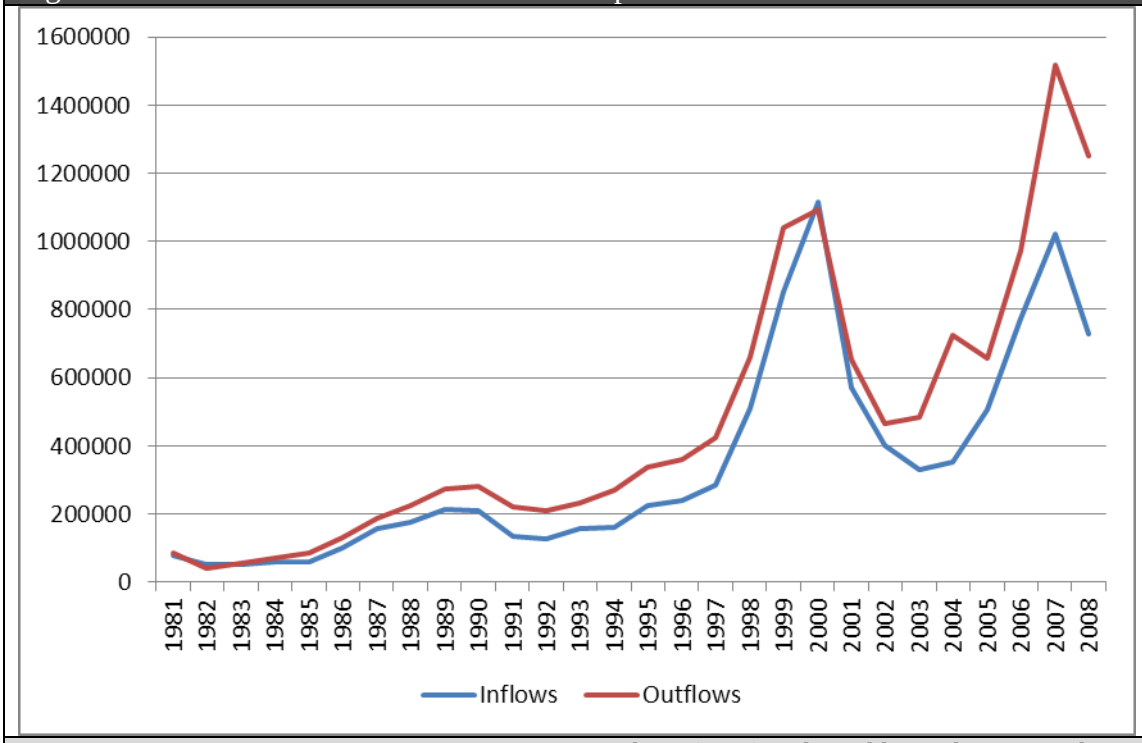
MNEs in the fourth group are prompted to seek strategic foreign assets to strengthen their competitive position in the international market. These assets might include technology, innovatory capacity, organizational systems, management and marketing skills and so on. Moreover, the MNEs can enjoy other benefits associated with foreign production e.g. common governance of diversified cross-border activities, opening up new markets, creating R&D synergies, lowering transaction costs, spreading the costs of administrative overheads and risk. Most strategic asset seeking FDI concentrates on the technology and information intensive sectors (Dunning, 1993).

2.4 FDI trends

Figure 2.1 represents the general trend of FDI inflows and FDI outflows in developed OECD countries, which form the basis of the empirical analysis. The amount of inflows was relatively small and fluctuated a little between 1981 and 1992. From 1992, it rose steadily to 1997 and increased dramatically to the peak level in 2000. According to UNCTAD (2006), the trends are driven by cross-border mergers and acquisitions (M&As). However, from the highest level in 2000, inflows fell sharply by about 50 percent in 2001, returning to the level in 1998. According to UNCTAD (2002), this decline reflected the slow-down of economic activity in developed countries and a decrease in their stock market activity, which reduced new international investment, particularly the cross-border M&As. The event of 11 September 2001 exacerbated the slowdown, which may also have contributed to the further decline in 2002 and 2003 (UNCTAD, 2002). In 2004, inflows started to pick up following three years of decline, which reflects the recovery and higher growth rates in some countries (UNCTAD, 2006). After four years of consecutive growth, inflows rose in 2007 by more than 30% and reached another high level, which was close to the record high level in 2000. The

increase in inflows reflected high economic growth and strong corporate performance in many countries (UNCTAD, 2008). After the global financial and economic crisis in 2007, the decline of corporate profits and stock prices greatly reduced the value of cross-border M&As, which resulted in 29% fall in inflows in 2008 (UNCTAD, 2009).

Figure 2.1 FDI inflows and outflows in developed OECD countries



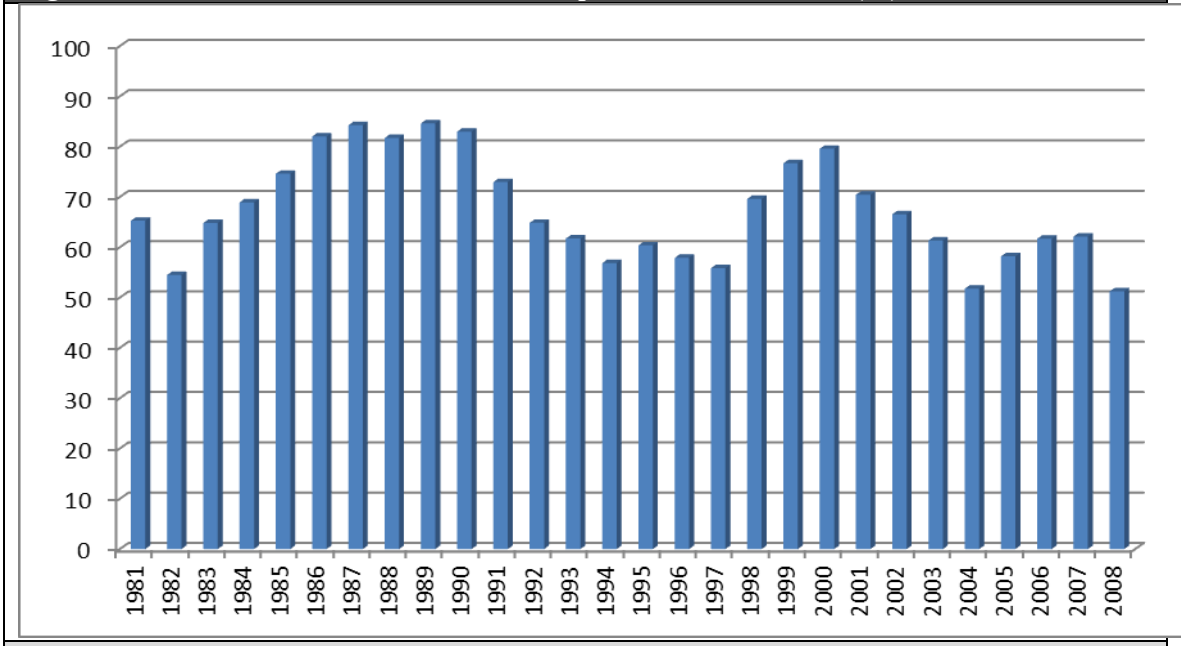
Data source: UNCTAD Foreign Direct Investment Database (2011) and World Development Indicators (2011).
Notes: (1) Data are in millions of 2000 US $. (2) Developed OECD countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea (Republic of), Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK and US. (3) Germany refers to former federal republic of Germany (West Germany) before 1990 and it refers to both former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990.

FDI outflows followed a similar pattern to that for inflows from 1981 to 2002. Although in 2003 outflows started to recover, the recovery was short-lived as there was a further decline in 2005, whilst 2006 and 2007 experienced huge increases in outflows. Outflows reached the all-time peak level in 2007, which was 39% higher than the outflows in 2000. However, outflows fell again by 18% in 2008 due to global financial crisis. Another difference between inflows and outflows is that the outflow line is above the inflow line for most years, indicating that outflows are more than inflows in

developed OECD countries. According to UNCTAD (2006), outflow trends are also driven by cross-border M&As.

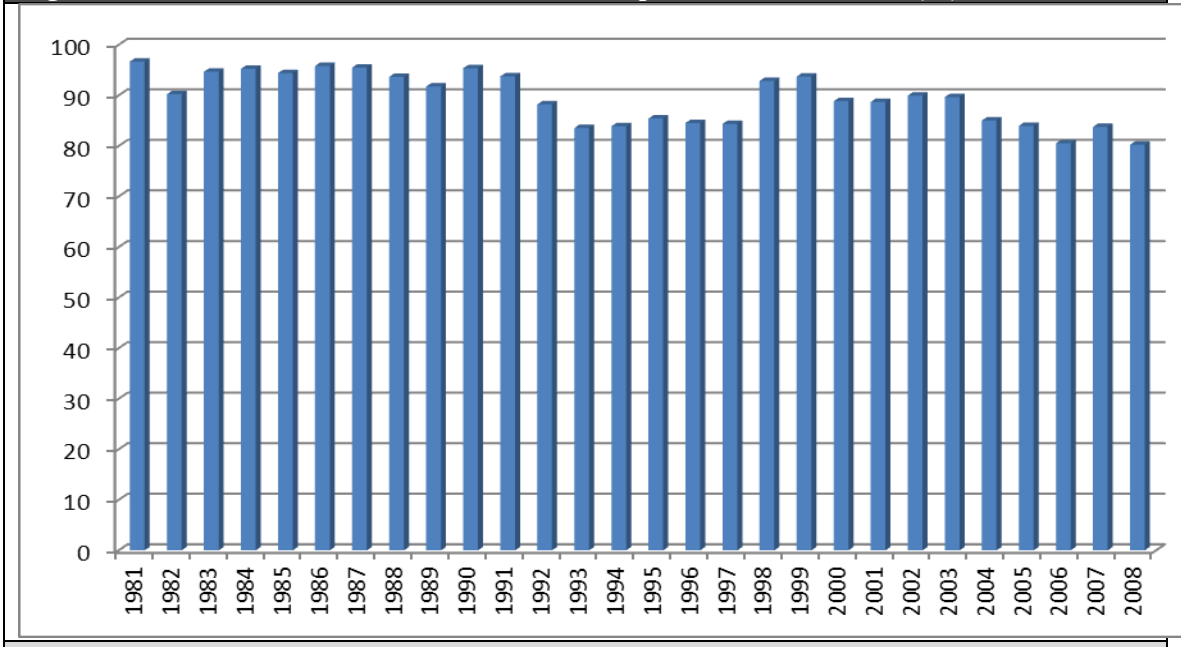
Turning to the share of world FDI inflows shown in Figure 2.2, we can see that the share of developed OECD countries fluctuates from 51% to 85% between 1981 and 2008, with an average of approximately 67%. Therefore, developed OECD countries account for a significant proportion of world inflows. With respect to the share of world FDI outflows illustrated in Figure 2.3, developed OECD countries account for most of global outflows ranging from 80% to 97% between 1981 and 2008. The average share is as high as 89%, so developed OECD countries are the dominant FDI exporters. Hence, we conclude that OECD countries are the major sources and recipients of world FDI. FDI inflows/outflows in OECD countries drive the world FDI inflows/outflows pattern. Compared with developed countries, developing countries only contribute a small fraction of world FDI inflows/outflows. However, the majority of current literature focuses on FDI in developing countries, studies on developed countries are relatively scarce, which will be discussed in Chapter 3. Therefore, it is important to investigate FDI inflows and outflows in developed OECD countries and that is why this study concentrates on this group of economies.

Figure 2.2 Share of world inflows to developed OECD countries (%)



Data source: UNCTAD Foreign Direct Investment Database (2011).
Notes: (1) Developed OECD countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea (Republic of), Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK and US. (2) Germany refers to former federal republic of Germany (West Germany) before 1990 and it refers to both former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990.

Figure 2.3 Share of World outflows from developed OECD countries (%)



Data source: UNCTAD Foreign Direct Investment Database (2011).
Notes: (1) Developed OECD countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea (Republic of), Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK and US. (2) Germany refers to former federal republic of Germany (West Germany) before 1990 and it refers to both former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990.

2.5 FDI distribution

The distribution of FDI inflows/outflows to/from the developed OECD countries has been relatively uneven. Looking at FDI as a percentage of total world, Table 2.1 shows that the most attractive host developed countries are US, UK, France, Spain, Netherlands, Canada, Germany and Australia in the last three decades, accounting for more than 50% of world inflows. Regarding the outflows of FDI, the largest foreign investors are US, UK, Japan, France, Germany, Netherlands, Canada and Switzerland, accounting about 70% of world outflows. If we take the market size of the host countries and home countries into consideration, the rankings change significantly. The third and fourth column in Table 2.1 present FDI inflows as a percentage of host country's GDP and FDI outflows as a percentage of home country's GDP. Netherlands, Ireland, Iceland, Sweden, UK are successful in attracting FDI inflows. In terms of FDI outflows, the largest home countries are Netherlands, Switzerland, Iceland, Sweden and UK. However, compared with the first two columns, US is not the largest country in terms of inflows and outflows of FDI.

Figures 2.2 and 2.3 indicate that around 70% of world FDI inflows go to developed OECD countries and about 90% of world FDI outflows originate from developed OECD countries. Therefore, developed OECD countries as a whole contribute the majority of world inflows/outflows. However, there are significant differences in inflows/outflows among individual developed OECD countries shown in Table 2.1. Hence, it is interesting to examine why different OECD countries have different amounts of FDI inflows/outflows and what factors affect FDI inflows/outflows.

Table 2.1 Annual average FDI data from 1981 to 2008							
FDI as a percentage of total world (%)				FDI as a percentage of GDP (%)			
Inflows		Outflows		Inflows		Outflows	
US	23.51	US	19.38	Netherlands	4.22	Netherlands	6.65
UK	8.55	UK	12.99	Ireland	3.89	Switzerland	6.25
France	5.48	Japan	8.85	Iceland	3.73	Iceland	6.17
Spain	3.76	France	8.75	Sweden	3.72	Sweden	4.61
Netherlands	3.24	Germany	8.01	UK	2.86	UK	4.31
Canada	3.12	Netherlands	5.92	Spain	2.46	France	3.08
Germany	2.92	Canada	4.29	Denmark	2.41	Finland	3.04
Australia	2.67	Switzerland	3.29	New Zealand	2.38	Ireland	2.98
Italy	1.70	Sweden	2.81	Switzerland	2.38	Spain	2.71
Sweden	1.65	Spain	2.71	Canada	2.17	Denmark	2.70
Switzerland	1.20	Italy	2.68	Australia	2.14	Canada	2.45
Denmark	0.62	Australia	1.42	Portugal	2.05	Norway	2.35
Japan	0.60	Norway	0.90	Finland	1.88	Austria	1.79
Ireland	0.59	Denmark	0.78	France	1.72	Germany	1.71
Portugal	0.56	Finland	0.74	Austria	1.48	Portugal	1.41
Austria	0.55	Austria	0.62	Norway	1.37	Australia	1.15
Korea	0.48	Korea	0.61	US	1.12	US	1.03
Norway	0.47	Ireland	0.50	Germany	1.03	Italy	1.01
New Zealand	0.42	Portugal	0.27	Greece	0.88	Japan	0.82
Finland	0.41	New Zealand	0.18	Italy	0.61	New Zealand	0.74
Greece	0.40	Iceland	0.09	Korea	0.56	Korea	0.65
Iceland	0.05	Greece	0.07	Japan	0.09	Greece	0.37
Belgium	na	Belgium	na	Belgium	na	Belgium	na
Luxembourg	na	Luxembourg	na	Luxembourg	na	Luxembourg	na

Data source: UNCTAD Foreign Direct Investment Database (2009).
Notes: (1) na: not available. (2) Germany refers to former federal republic of Germany (West Germany) before 1990 and it refers to both former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990.

2.6 Conclusion

In summary, this chapter discusses the definition of FDI, the types of FDI, FDI trends and FDI distribution. From the trends of inward/outward FDI to/from developed OECD countries, it is apparent that the developed OECD countries encompass the significant proportion of global FDI inflows and outflows. Therefore, we can conclude that developed OECD countries have substantial amounts of two-way FDI flows and developed OECD countries are major sources and recipients of global FDI. However, the majority of current literature concentrates on developing countries, or a sample of both developed and developing countries, such that studies on developed countries only

are limited, which will be discussed in Chapter 3. Therefore, this thesis contributes to the literature by focusing on this group of developed OECD countries. However, from FDI distribution, we can see that individual countries have different amounts of FDI inflows/outflows. Therefore, it is important to examine what factors attract inward FDI and what factors encourage outward FDI.

3 Economic theories and empirical literature

3.1 Introduction

Ghosh and Wang (2009) argue that developing and developed countries are likely to have different experiences in terms of the relationship between inward FDI and economic growth, so it is important to distinguish the differences. However, most empirical studies either focus on developing countries or pool both developed and developing countries into one sample. According to Blonigen and Wang (2005), if the relationships between inward FDI and growth for developed and developing countries are different, the pooled coefficient estimates significantly misrepresent the true relationships for both sets of countries and it is inappropriate to pool the two sets of countries together. In addition, Section 2.4 indicates that developed OECD countries are the major sources and recipients of world FDI. Therefore, this study concentrates on developed OECD countries.

There are three research questions in this thesis. Section 2.4 indicates that developed OECD countries attract the majority of inward FDI in the world, so they must provide favourable conditions for multinational firms to make profits. The first research question examines the favourable factors in developed OECD countries that attract inward FDI. Developed OECD countries are also the sources of most outward FDI in the world. Thus, the second research question investigates what home country characteristics encourage FDI abroad. The third research question is to analyse the relationship between inward/outward FDI and economic growth in developed OECD countries.

This chapter first reviews the theoretical models and empirical studies on the determinants of inward/outward FDI (the first and second research questions). Following this, it outlines the economic theory and empirical literature on the relationship between inward/outward FDI and economic growth (the third research question). Finally, it presents the research approach and data collection method used in this study.

3.2 Theoretical determinants of FDI and literature review

This section presents a review of different theoretical models on the determinants of FDI, which explains why some countries invest abroad and why some countries are more successful in receiving inward FDI. The theoretical models are divided into theories assuming perfect markets and those assuming imperfect markets, which is similar with the approach that Agarwal (1980) and Moosa (2002) discuss the theories. These theories are referred to as hypotheses suggested by Agarwal (1980) as there is a number of competing theories with varying degrees of power to explain FDI. In addition, this section also summarizes the findings of empirical studies on determinants of FDI based on each theory.

3.2.1 Theories assuming perfect markets

Under the assumption of perfect competition on factor and/or product markets, the three theories which explain why firms invest abroad are the differential rates of return hypothesis, the portfolio diversification hypothesis and the market size hypothesis.

3.2.1.1 The differential rates of return hypothesis

Under the assumption of perfect competition, the differential rates of return model explains FDI as a function to differences in the rates of return on capital between countries. This model is based on Heckscher-Ohlin notion that a capital-abundant country should export capital-intensive goods to foreign countries. According to capital

theory model, a capital abundant country with lower capital returns invests in capital-scarce countries with higher capital returns to maximize the expected profits. Hence, FDI flows from countries with lower rate of return on capital to countries with higher rate of return on capital (Hufbauer, 1975).

The disadvantage of this theory is that it implies that capital flows in one direction only – from countries with lower rate of return to countries with higher rate of return. Therefore, it cannot explain why a country experiences FDI inflows and FDI outflows from/to another country at the same time (Moosa, 2002). Moreover, this hypothesis assumes risk neutrality, which implies that FDI and domestic investment are perfect substitutes or FDI in one country is a perfect substitute for FDI in any other country (Moosa, 2002). Another problem is that the theory relates FDI to the rate of return from expected profit and the empirical tests are based on rate of return from reported profit. However, reported profits do not accurately reflect the expected profits or actual profits as reported profits do not show the effect of tax arrangement, transfer prices, accounting procedures and so on (Hufbauer, 1975; Agarwal, 1980; Moosa, 2002). In addition, the hypothesis refers to the profits during the whole investment period, whereas the reported profits refer to the profits over a year (Agarwal, 1980; Moosa, 2002). Moreover, it does not explain why a firm engages in FDI rather than portfolio investment (Moosa, 2002). Finally, the model assumes that the objective of FDI is to maximize profits. However, firms might invest abroad for other reasons, particularly in the short- and medium-run, such as achieving higher economies of scale, avoiding trade barriers, expanding market in the host country, etc (Agarwal, 1980; Moosa, 2002).

Empirical studies testing this hypothesis only offer weak support. Bandera and White (1968) analyse American investments in seven developed countries in manufacturing, petroleum and trade sectors, they find that the rate of return variable is not significant. Moreover, using US manufacturing investment in seven developing countries, Reuber *et al.* (1973) find that US investment and the rate of return in the host country are not correlated for five countries. However, a positive and significant relationship is observed between the two variables in two countries.

3.2.1.2 The portfolio diversification hypothesis

According to this theory, the assumption of risk neutrality is relaxed, investors take into account not only the rate of return on capital, but also risk when making investment decisions. Investment is positively related with rate of return and negatively related with risk. Hence, investors try to achieve higher rate of capital return and diversify investment to reduce risk (Hufbauer, 1975; Agarwal, 1980; Moosa, 2002).

This hypothesis offers a plausible explanation of cross-investment between countries and industries. However, it does not explain why direct investment is preferred to portfolio investment for geographical diversification (Agarwal, 1980; Moosa, 2002). Moreover, it cannot explain why firms in certain industries tend to produce abroad, while firms in other industries do not (Hufbauer, 1975; Agarwal, 1980). In addition, the variance of rate of return is used to measure risk and it is not reliable as the rate of return is calculated from reported profits, which are not equal to actual profits (Agarwal, 1980; Moosa, 2002).

Empirical studies aimed at testing this hypothesis provide some supporting evidence. Using manufacturing FDI data from US into Latin America as a whole, Stevens (1969)

finds that risk negatively affects FDI in Latin America overall, while at country level, the study detects some evidence of the hypothesis in Brazil. However, the results at country level are proved to be inferior compared to other empirical models. In addition, Prachoway (1972) analyses FDI in the US and finds evidence in favour of the hypothesis. Moreover, Cohen (1975) finds that large US corporations with more extensive foreign activities appear to have smaller fluctuations in global profits and sales.

3.2.1.3 The market size hypothesis

This hypothesis postulates that inward FDI is positively correlated with the sales of foreign firms in the host country. The theoretical model of market size hypothesis is based on the neoclassical domestic investment theories, which indicate that domestic firms increase their investment in response to their sales (Agarwal, 1980; Moosa, 2002). This hypothesis is applied at the macro level, which indicates that inward FDI is a function of the host country's market size such as GDP. A large market in the host country may help foreign investors to reduce fixed cost per unit of output, capture economies of scale of production and reduce the total cost of supplying the local market (Torrisi, 1985; Tsai, 1994; Shatz and Venables, 2000; Lim, 2001).

There are some disadvantages about this hypothesis. According to Agarwal (1980) and Moosa (2002), the use of macro level market size variable does not have much theoretical foundation as the use of foreign firms' sales. However, data on the sales of foreign firms in the host country are generally not available. Therefore, the majority of studies apply macro level variables to measure market size. Moreover, market size tends to affect FDI which seeks to serve the domestic market, not FDI which is produced for exports (Agarwal, 1980; Moosa, 2002).

Most empirical studies support the hypothesis and find that the host country's market size plays a positive role in explaining the location of inward FDI (Schneider and Frey, 1985; Torrisi, 1985; Bajo-Rubio and Sosvilla-Rivero, 1994; Shamsuddin, 1994; Tsai, 1994; Wang and Swain, 1995; Billington, 1999; Globerman and Shapiro, 1999; Morisset, 2000; Obwona, 2001; Globerman and Shapiro, 2002; Kucera, 2002; Trevino *et al.*, 2002; Bengoa and Sanchez-Robles, 2003; Egger and Winner, 2005; Grosse and Trevino, 2005; Kottaridi, 2005; Asiedu, 2006; Fedderke and Romm, 2006; Ramirez, 2006; Wijeweera and Clark, 2006; Greenaway *et al*., 2007; Ang, 2008; Fukumi and Nishijima, 2010). However, Lipsey (2000), Filippaios *et al.* (2003), Radulescu and Robson (2008) find some evidence of a negative relationship between inward FDI and market size, implying that inward FDI is attracted to smaller rather than larger economies.

3.2.2 Theories assuming imperfect markets

Kindleberger (1969) argues that FDI cannot exist in perfect markets and the market for goods or factors must be imperfect in order for FDI to take place. There are five theories based on imperfect markets – the Hymer-Kindleberger hypothesis, the product life cycle hypothesis, the oligopolistic reaction hypothesis, the internalization hypothesis and the eclectic paradigm. These theories assume that the firms investing in a foreign country have some comparative advantages over the local firms in the host country (Agarwal, 1980).

3.2.2.1 The Hymer-Kindleberger hypothesis

The idea of imperfect goods or factor markets was put forward by Hymer in his doctoral thesis in 1960 and was published in 1976, whilst Kindleberger (1969) refined and extended the theory. According to the hypothesis, foreign firms that undertake FDI have some disadvantages compared with local firms such as lack of knowledge of local

market and business conditions, differences in political and legal systems, higher uncertainty as well as the cost of operating at a distance from their decision-making centre. Therefore, foreign firms must possess some ownership advantages in order to overcome the costs of operating in the host country and competing with local competitors. These ownership advantages have to be transferable from one country to another, which includes product differentiation, marketing skills, technology, managerial skills and economies of scale. These advantages give rise to goods and factor markets imperfection and enable foreign firms earn more than at home and more than local firms (Kindleberger, 1969). However, this hypothesis does not provide an explanation why FDI is preferred over exports or licensing (Agarwal, 1980). In addition, it fails to explain why firms choose to invest in country A rather than country B (Moosa, 2002).

Establishing ownership advantages as determinants of FDI leads to a number of empirical studies. Horst (1972) shows that large US firms are more likely to invest in Canada by examining over a thousand American manufacturing corporations. Holding firm size constant, the results find that more firms in an industry invest abroad when the industry's R&D expenditure is higher. Furthermore, industries with more average-sized firms have fewer firms investing abroad, because economies of scale only encourage large firms to carry out outward FDI. Applying data on 64 industries in Canada and UK, Caves (1974) concludes that large foreign firms and multi-plant foreign firms have larger sales in Canada and UK. In addition, the industry's advertising and research intensity in the foreign country are also important determinants of the foreign firms' sales in Canada. Wolf (1977) examines data on 95 US manufacturing industries and

finds that large firm size and high technical manpower stimulate US manufacturing firms to invest abroad.

Lall's (1980) results support the view that foreign sales by US affiliates are determined by US industry's monopolistic advantages including advertising expenditure, R&D expenditure, economies of scale and general level of skills. Based on Cave's (1974) work, Saunders (1982) suggests that advertising, R&D expenditure, managerial resources and multi-plant development in foreign industries influence foreign firms' investment decisions in Canada. Analysing data on 115 Canadian manufacturing industries, Owen (1982) finds that the ownership advantages of US multinational firms are advertising, R&D intensity, economies of scale and firm size. Blomstrom and Lipsey (1986) examine American and Swedish manufacturing firms and find that firm size has a threshold effect on their outward FDI. Among multinational firms investing abroad, large firms do not have more advantages compared with small firms. In addition, R&D expenditure and advertising expenditure have positive impacts on American firms' foreign sales. In terms of Swedish firms, R&D expenditure positively affects their foreign sales.

3.2.2.2 The product life cycle hypothesis

According to Vernon (1966), the life cycle of a product goes through three stages. In the first stage, an innovating firm in the most advanced country produces a new product in its home country to take advantage of the home market's demand. The firm chooses home country as the production location to undertake product improvement and to reduce the costs of communication between producers and customers. During the second stage, the product is more developed and mature. The rising demand abroad leads the innovating firm to export the product to other developed countries. In addition,

FDI is undertaken by the innovating firm when the demand in a foreign market is large enough to support local production. The final stage is marked by the standardization of the product. The intensive price competition from other producers forces the innovating firm to relocate the production into less developed countries to reduce labour costs and to achieve economies of scale.

However, Vernon (1971) acknowledges that the model deliberately simplifies the reality and does not take into consideration the more complex sociological, political and idiosyncratic factors. In addition, the model assumes that innovations originate in highly innovative industries in developed countries, not in developing countries (Solomon, 1978). Moreover, it assumes that multinational firms are able to develop and standardise products almost at the same time without significant time lags (Buckley, 1985).

Looking at empirical evidence, Parry (1975) analyses a sample of pharmaceutical products by six UK-owned multinational pharmaceutical firms and finds a positive link between product age and the degree of international production. Therefore, the findings lend some support to the validity of the product life cycle hypothesis.

3.2.2.3 The oligopolistic reaction hypothesis

Knickerbocker (1973) argues that entry concentration is positively correlated with industry concentration except in the market with high structural stability. Oligopolistic firms adopt the 'follow-the-leader' strategy to invest abroad to counter the competitive advantages of the leader firm. Knickerbocker (1973) analyses the behaviour of 187 American firms investing in 23 foreign countries and finds evidence of the hypothesis. Therefore Knickerbocker (1973) concludes that FDI is a function of oligopolistic reaction. However, there are some criticisms about the theory. It does not explain why

the leader firm invests abroad in the first place (Knickerbocker, 1973; Agarwal, 1980). Moreover, it fails to explain why some American industries carry out FDI abroad and some industries do not (Knickerbocker, 1973). Finally, it does not take into account of the firms with dispersive investments (Agarwal, 1980).

3.2.2.4 The internalization hypothesis

Buckely and Casson (1976) argue that firms undertake FDI by internalizing in the foreign markets due to the imperfections in intermediate product markets such as human capital, knowledge, marketing expertise, technology and so on. There are benefits and costs of internalising markets such that FDI is taken up as long as benefits are greater than costs. Benefits include avoidance of time lags in business activities, implementation of price discrimination, elimination of bargaining and buyer uncertainty, minimization of the impact of government interventions through transfer pricing. Costs of internalization arise from communication, administrative and coordination expenses. This theory explains why a firm chooses FDI instead of exporting or licensing. However, it does not apply in the short run to small multinational firms operating in fewer foreign locations (Agarwal, 1980). In addition, the theory takes into account the multinational firms' reaction to market imperfections, but does not incorporate the role of multinational firms in creating market imperfections (Buckley, 1985). Finally, this theory's empirical verification is very difficult (Agarwal, 1980) as the hypothesis is so general and cannot be tested directly (Buckley, 1988). Buckely and Casson (1976) carry out the statistical tests of the theory based on simple assumptions and conclude that the process of internalization is concentrated in high R&D expenditure industries.

3.2.2.5 The eclectic paradigm

Dunning (1977, 1988 and 1993) introduces the eclectic paradigm, which provides the most comprehensive explanation of firms' foreign production. This theory combines the

various factors discussed above and adds the location advantage in explaining FDI. A firm will engage in foreign production activities when three conditions are satisfied, namely ownership advantages, internalization advantages and location advantages. The more ownership advantages that a country's indigenous firms have, the more incentive they have to internalize a foreign market. The more location advantages that a foreign country has, the more they are likely to engage in outward FDI (Dunning, 1993). A firm has to have all of the three advantages in order to engage in FDI. If there are ownership advantages, location advantages and no internalisation gains, the firm will licence its ownership advantages to another firm. If there are only ownership advantages and internalisation advantages, the firm will produce at home and export the products abroad (Moosa, 2002). Table 3.1 summarizes the three advantages of the eclectic paradigm – ownership advantages, internalization advantages and location advantages.

Table 3.1 The eclectic paradigm of international production

1. *Ownership-Specific Advantages* of an enterprise of one nationality over those of another.

a. Property rights and/or intangible asset advantages (Oa); the resource (asset) structure of the firm. Product innovations, production management, organizational and marketing systems, innovatory capacity, organization of work, non-codifiable knowledge: 'bank' of human capital experience; marketing, finance, know-how, etc. Ability to reduce costs of intra and/or inter-firm transactions.

b. Advantages of common governance, that is, of organizing Oa with complementary assets (Ot).

   i. Those that branch plants of established enterprises may enjoy over *de novo* firms. Those resulting mainly from size, product diversity and learning experiences of enterprise (e.g. economies of scope and specialization). Exclusive or favoured access to inputs (e.g. labour, natural resources, finance, information). Ability to obtain inputs on favoured terms (as a result of size or monopsonistic influence). Ability of parent company to conclude productive and cooperative inter-firm relationships, for example, as between Japanese auto assemblers and their suppliers. Exclusive or favoured access to product markets. Access to resources of parent company at marginal cost. Synergistic economies (not only in production, but in purchasing, marketing, finance, etc, arrangements).

   ii. Which specifically arise because of multinationality. Mulitnationality

enhances operational flexibility by offering wider opportunities for arbitraging, production shifting, and global sourcing of inputs. More favoured access to and/or better knowledge about international markets (e.g. for information, finance, labour, etc). Ability to take advantage of geographic differences in factor endowments, government intervention, markets, etc. Ability to diversify or reduce risks (e.g. in different currency areas and creation of options and/or political and cultural scenarios). Ability to learn from societal differences in organizational and managerial processes and systems. Balancing economies of integration need to respond to differences in country-specific resources and consumer demands.
2 *Internalization-Incentive Advantages* (i.e. to circumvent or exploit market failure). • To avoid search and negotiating costs. • To avoid costs of moral hazard and adverse selection, and to protect reputation of internalizing firm. • To avoid costs of broken contracts and ensuing litigation. • Buyer uncertainty (about nature and value of inputs, for example, technology, being sold). • When market does not permit price discrimination. • Need of seller to protect quality of intermediate or final products. • To capture economies of interdependent activities (see b above). • To compensate for absence of future markets. • To avoid or exploit government intervention (quotas, tariffs, price controls, tax differences, etc). • To control supplies and conditions of sale of inputs (including technology). • To control market outlets (including those which might be used by competitors). • To be able to engage in practices, such as cross-subsidization, predatory pricing, leads and lags, transfer pricing as a competitive (or anti-competitive) strategy.
3 *Location-Specific Variables* (these may favour home or host countries). • Spatial distribution of natural and created resource endowments and markets. • Input prices, quality and productivity (e.g. labour, energy, materials, components, semi-finished goods). • International transport and communication costs. • Investment incentives and disincentives (including performance requirements, etc). • Artificial barriers (e.g. import controls) to trade in goods and services. • Societal and infrastructure provisions (commercial, legal, educational, transport and communication). • Cross-country ideological, language, cultural, business, political differences. • Economies of centralization of R&D production and marketing. • Economic system and strategies of government: the institutional framework for resource allocation.
Source: Dunning (1993), 81. Note: Oa is asset advantages and Ot is transaction cost minimizing advantages.

3.2.2.5.1 Ownership advantages

According to Dunning (1977, 1988 and 1993), ownership advantages are the competitive advantages that a country's firms may possess over another country's firms. These must be sufficient to compensate for the costs of producing in a foreign country and the disadvantages of competing with local firms. There are three kinds of ownership advantages. The first type includes a set of income-generating assets such as property rights and intangible assets (eg. technology and information, product innovation, innovatory capacity, human capital, organizational systems, marketing, managerial and entrepreneurial skills etc). These assets allow the firms to achieve higher levels of productivity/efficiency and obtain more market power in a foreign country.

The second kind includes the advantages that an established firm may enjoy over a *de novo* firm producing in a foreign location. These advantages are derived from size, monopoly power, better resource capacity and usage of the established firm. For example, the established firm may benefit from accessing to resources (e.g. inputs, market knowledge, accounting procedures, administrative experience etc.) from parent company at low marginal costs, whereas the *de novo* firm has to bear the full cost in getting those resources. Other advantages are favoured access to inputs, favoured access to product markets, economies of scale and specialization, economies of joint supply in production, purchasing, marketing, finance, etc. The third type of advantages stems from the multinationality. Multinationality offers more favoured access to and better knowledge about international markets, which enables the firms to take advantage of geographic differences in factor endowments/markets and to reduce the foreign

exchange risk/political risk in producing in the host country (Dunning, 1977; Dunning, 1988; Dunning, 1993).

3.2.2.5.2 Internalization advantages

Dunning (1988) argues that a firm enters the intermediate product market in a foreign country when it is in its best interest to transfer ownership advantages across national boundaries within its own organizations rather than to sell them or their right of use to foreign based firms. The incentives for foreign firms to internalize markets are to avoid disadvantages of market failure or to exploit the advantages of market failure. Three main kinds of market failure are identified. The first one is that buyers and sellers do not have complete information. Buyers might be uncertain about the value, quality and delivering time of inputs being sold. From the sellers' viewpoint, they might want to protect their reputation, the quality of intermediate or final products. The second market failure is that foreign firms can exploit the economies of large scale production. Therefore, by internalizing the markets, the foreign firms can benefit from common governance and from other internalizing practices such as arbitraging, cross-subsidization of costs, leading and lagging in payments, transfer-price manipulation. The final market failure occurs where the transaction of a particular good or service yields costs and benefits external to that transaction. Internalization can help foreign firms to avoid costs of enforcing property rights, to avoid or exploit government intervention, to safeguard supplies of inputs, to guarantee markets and so on.

3.2.2.5.3 Location advantages

The third advantage is concerned with the location of production. Firms will engage in foreign production when they perceive location advantages in a foreign country. Otherwise, firms would serve domestic markets by domestic production and foreign markets by exports (Dunning, 1988).

3.2.2.5.4 Host country factors that affect inward FDI

The location advantages in a host country might affect the amount of inward FDI that the country receives, which includes labour cost, trade union density, employment protection legislation, wage bargaining coordination, R&D expenditure, market size, economic growth, agglomeration, trade barrier, trade openness, exchange rate, inflation rate, corporate tax, human capital, infrastructure, political instability, country risk, corruption and rule of law.

Labour cost

Labour cost plays an important role in affecting inward FDI, whereby higher labour cost in the host country is expected to be a deterrent of inward FDI as foreign investors would like to minimize the cost of production. However, the relationship between labour cost and inward FDI could be positive such that if higher labour cost reflects a higher skill level, FDI may flow to high labour cost countries because of high skill requirements (Noorbakhsh *et al.*, 2001). Moreover, Yang *et al.* (2000) argue that an increase in labour cost may result in a substitution in production of capital for labour and therefore encourage inward capital investment. Turning to the empirical evidence on developed countries, most studies find it to be a negative determinant of inward FDI, while two studies find it to be a positive determinant and five studies find it to be an insignificant determinant (see Table 3.2). Therefore, we expect a positive or negative impact of labour cost on inward FDI in developed host countries.

Table 3.2 The effect of labour cost in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Cushman (1987)	Bilateral FDI from 5 developed countries	1 developed country	Negative
Culem (1988)	Bilateral FDI from 6 developed countries	6 developed countries	Negative
Moore (1993)	Bilateral FDI from	17 developed	Negative

	Germany in manufacturing sector	countries	
Pain (1993)	FDI from the rest of the world	1 developed country	Negative
Bajo-Rubio and Sosvilla-Rivero (1994)	FDI from the rest of the world	1 developed country	Insignificant
Barrell and Pain (1996)	Bilateral FDI from Japan	7 developed countries	Negative
Cooke (1997)	Bilateral FDI from US in 9 industries	19 developed countries	Insignificant
Billington (1999)	FDI from the rest of the world	7 developed countries	Insignificant
Ford and Strange (1999)	FDI from 520 Japanese firms	7 developed countries	Negative
Globerman and Shapiro (1999)	FDI from the rest of the world	1 developed country	Negative
Vannoni (1999)	FDI from 67 Italian firms	10 developed countries	Negative
Yang *et al.* (2000)	FDI from the rest of the world	1 developed country	Positive
Filippaios *et al.* (2003)	Bilateral FDI from US	4 developed countries	Negative (Australia and New Zealand) Positive (Japan and Korea)
Love (2003)	Bilateral FDI from 7 developed countries in 8 industries	1 developed country	Insignificant
Kottaridi (2005)	FDI from the rest of the world	10 developed countries	Negative
De Vita and Abbott (2007)	Bilateral FDI from 7 developed countries in manufacturing sector	1 developed country	Insignificant
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Schneider and Frey (1985)	FDI from the rest of the world	54 developing countries	Negative
Shamsuddin (1994)	FDI from the rest of the world	36 developing countries	Negative
Tsai (1994)	FDI from the rest of the world	62 developing countries	Negative in the 1980s Insignificant in the 1970s
Singh and Jun (1995)	FDI from the rest of the world	31 developed and developing countries	Negative
Wang and Swain (1995)	FDI from the rest of the world	2 developing countries	Positive (China) Insignificant

			(Hungary)
Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Positive
Bende-Nabende *et al.* (2001)	FDI from the rest of the world	5 developing countries	Negative (Indonesia, Singapore and Thailand) Insignificant (Malaysia and Philippines)
Noorbakhsh *et al.* (2001)	FDI from the rest of the world	36 developing countries	Insignificant
Kucera (2002)	FDI from the rest of the world	127 developed and developing countries	Negative
Campos and Kinoshita (2003)	FDI from the rest of the world	25 developing countries	Negative
Bognanno et al. (2005)	Bilateral FDI from US in 7 industries	22 developed and developing countries	Negative
Javorcik and Spatareanu (2005)	FDI from 10,000 European firms	19 developed and developing countries	Negative
Fedderke and Romm (2006)	FDI from the rest of the world	1 developing country	Negative
Greenaway *et al.* (2007)	FDI from the rest of the world	54 developing countries	Insignificant
Dewit *et al.* (2009)	Bilateral FDI from 27 developed and developing countries	27 developed and developing countries	Negative
Leibrecht and Scharler (2009)	Bilateral FDI from 7 developed countries	7 developing countries	Negative
Source: Author's own work.			

Trade union density

A high level of trade union density might have a detrimental effect on FDI inflows as it raises labour costs and the costs of investment. Moreover, foreign firms incur transaction costs associated with union actions such as wage bargaining and strikes etc (Cooke, 1997). Furthermore, the rent-extraction activities of trade unions limit the profitability of foreign investment (Radulescu and Robson, 2008). In addition, unions might have the power to maintain high wages and benefits for workers (Cooke, 1997). On the other hand, the impact of unionization on inward FDI can be beneficial due to the positive association between unionization and productivity (Karier, 1995; Ford and

Strange, 1999). Billington (1999) argues that union membership boosts morale, which in turn raises productivity and attracts FDI inflows. Looking at the empirical evidence on developed countries, all four studies show that a high rate of union membership in the host country deters inward FDI (see Table 3.3). Therefore, based on economic theory and empirical literature, we expect a positive or negative relationship between union density and inward FDI in developed host countries.

Table 3.3 The effect of union density in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Cooke (1997)	Bilateral FDI from US in 9 industries	19 developed countries	Negative
Ford and Strange (1999)	520 Japanese firms' decision to invest abroad	7 developed countries	Negative
Ham and Kleiner (2007)	Bilateral FDI from 19 developed countries	19 developed countries	Negative
Radulescu and Robson (2008)	FDI from the rest of world	19 developed countries	Negative
Studies on a mix of developed and developing host countries			
Author	Data type	Host country	Results
Karier (1995)	Bilateral FDI from US in 32 industries	10 developed and developing countries	Insignificant
Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Negative
Kucera (2002)	FDI from the rest of world	127 developed and developing countries	Insignificant
Bognanno *et al*. (2005)	Bilateral FDI from US in 7 industries	22 developed and developing countries	Insignificant
Dewit *et al.* (2009)	Bilateral FDI from 27 developed and developing countries	27 developed and developing countries	Negative

Source: Author's own work.

Employment protection legislation

Employment protection legislation is regarded as crucial in determining the relative attractiveness of locations to foreign investors. Rigid employment protection legislation incurs higher costs of employment adjustments (Dewit *et al.*, 2009) and imposes higher costs of production adjustments (Leibrecht and Scharler, 2009). Therefore, countries

with fewer employment protection restrictions have comparative advantages in attracting inward FDI (Dewit *et al.*, 2009). However, rigid regulation can be perceived to be an advantage for a country to attract FDI as it might reinforce commitment and loyalty to the employer, reduce labour turnover costs and maintain a trained workforce (Whyman *et al.*, 2008). The empirical studies use an index to measure employment protection legislation, whereby a higher index shows more rigid employment protection legislation (see Table 3.4). All three studies on developed countries suggest that host countries with flexible employment regulations are more successful in attracting inward FDI (see Table 3.4). Hence, based on economic theory and empirical literature, we expect a positive or negative effect of employment protection legislation on inward FDI in developed host countries.

Table 3.4 The effect of employment protection legislation in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Cooke (1997)	Bilateral FDI from US in 9 industries	19 developed countries	Negative
Ham and Kleiner (2007)	Bilateral FDI from 19 developed countries	19 developed countries	Negative
Radulescu and Robson (2008)	FDI from the rest of world	19 developed countries	Negative
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Negative
Bognanno *et al.* (2005)	Bilateral FDI from US in 7 industries	22 developed and developing countries	Negative
Gorg (2005)	Bilateral FDI from US	33 developed and developing countries	Negative
Javorcik and Spatareanu (2005)	7150 European firms' decisions to invest abroad	19 developed and developing countries	Negative
Benassy-Quere *et al.* (2007)	Bilateral FDI from 53 developed and developing countries	50 developed and developing countries	Negative
Dewit *et al.* (2009)	Bilateral FDI from 27 developed and	27 developed and developing countries	Negative

	developing countries		
Leibrecht and Scharler (2009)	Bilateral FDI from 7 developed countries	7 developing countries	Insignificant

Source: Author's own work.
Note: A higher index shows more rigid employment protection legislation.

Wage bargaining coordination

According to Radulescu and Robson (2008), foreign investors are likely to locate in countries where wage bargaining is uncoordinated, so that foreign investors can decide their own firm-level wages and employment conditions according to the specific characteristics of the firms, which suggests that decentralisation facilitates labour market flexibility and encourages inward FDI (Whyman *et al.*, 2008). However, Whyman *et al.* (2008) argue that inward FDI might be higher in countries with coordinated wage bargaining system as it might secure a lower rate of growth in aggregate real wages, reduce labour turnover and decrease labour recruitment costs. One study on developed countries analyses the effect of wage bargaining coordination on inward FDI and provides evidence that a coordinated system of wage bargaining (high index) reduces the attractiveness of an economy as a location for FDI (see Table 3.5). Therefore, based on economic theory and empirical literature, we expect that wage bargaining coordination either positively or negatively influences inward FDI in developed host countries.

Table 3.5 The effect of wage bargaining coordination in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Radulescu and Robson (2008)	FDI from the rest of world	19 developed countries	Negative
Studies on a mix of developed and developing host countries			
Author	Data type	Host country	Results
Dewit *et al.* (2009)	Bilateral FDI from 27 developed and developing countries	27 developed and developing countries	Negative

Source: Author's own work.
Note: A higher index shows a more coordinated wage bargaining system.

R&D expenditure

A firm might set up its production facilities abroad through FDI to exploit its ownership advantages such as advanced technology, marketing and management expertise, etc. Hence, FDI transfers technology from the home country to the host country. According to Kogut and Chang (1991), R&D expenditure leads to the creation of advanced technology. Therefore, higher inward FDI might be correlated with lower R&D expenditure in the host country. However, the motive of foreign investors to invest in a host country might be to access technology in the host country and transfer it to the home country. In that case, advanced technology in the host country attracts inward FDI. A number of studies investigate the impact of R&D expenditure in the host developed country and most studies find a positive impact (see Table 3.6). However, Kottaridi (2005) finds that R&D expenditure and inward FDI is negatively related in EU periphery countries (Greece, Ireland, Italy, Portugal and Spain). In addition, three studies do not find it as a significant determinant of inward FDI. Therefore, we expect a positive or negative relationship between R&D expenditure and inward FDI in developed host countries.

Table 3.6 The effect of R&D expenditure in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Kogut and Chang (1991)	FDI from Japanese firms in 297 industries	1 developed country	Positive
Drake and Caves (1992)	Bilateral FDI from Japan in 102 industries	1 developed country	Insignificant
Neven and Siotis (1996)	Bilateral FDI from 4 developed countries in 8 industries Bilateral FDI from US and Japan in 8 industries	4 developed countries in EC	Bilateral investment among EC countries Insignificant Bilateral US investment in EC countries Positive Bilateral Japan investment in EC countries

			Positive
Vannoni (1999)	FDI from 67 Italian firms	European Union (EU)	Positive
Driffield and Munday (2000)	FDI from the rest of world in 102 industries	1 developed country	Positive
Love (2003)	Bilateral FDI from 7 developed countries in 8 industries	1 developed country	Insignificant
Kottaridi (2005)	FDI from the rest of the world	10 developed countries	Positive (Belgium-Luxembourg, France, Germany, Netherlands and UK) Negative (Greece, Ireland, Italy, Portugal and Spain)
Studies on developing host countries			
Author	Data type	Host country	Results
Moosa (2009)	FDI from the rest of the world	18 developing countries	Positive
Source: Author's own work.			

Market size and economic growth

As discussed in 3.2.1.3, market size is expected to be positively correlated with inward FDI given that inward FDI is primarily to serve the local market. A large market in the host country may help foreign investors to reduce fixed cost per unit of output, capture economies of scale of production and reduce the total cost of supplying the local market (Torrisi, 1985; Tsai, 1994; Shatz and Venables, 2000; Lim, 2001). Most empirical studies on developed countries support these hypotheses and find that the host country's market size plays a positive role in explaining the location of inward FDI. However, three studies find a negative relationship between inward FDI and market size implying that inward FDI is attracted to smaller rather than larger developed economies. For example, Lipsey (2000) argues that large countries measured by nominal GDP receive less FDI, while rich countries measured by real GDP per capita receive more FDI. In addition, another two studies do not find any significant relationship (see Table 3.7).

Therefore, we expect that market size has a positive impact on inward FDI in developed host countries.

Table 3.7 Empirical studies that test market size hypothesis

Studies on developed host countries			
Author	Data type	Host country	Results
Bandera and White (1968)	Bilateral FDI from US in manufacturing sector, petroleum sector, trade sector	7 developed countries	Positive
Scaperlanda and Mauer (1969)	FDI from US	European Economic Community (EEC)	Positive
Scaperlanda and Mauer (1972)	FDI from US	European Economic Community (EEC)	Positive
Schmitz and Bieri (1972)	FDI from US	European Economic Community (EEC)	Positive
Lunn (1980)	FDI from US	European Economic Community (EEC)	Positive
Lunn (1983)	FDI from US	European Economic Community (EEC)	Positive
Scaperlanda and Balough (1983)	Manufacturing FDI from US	European Economic Community (EEC)	Positive
Cushman (1987)	Bilateral FDI from 5 developed countries	1 developed country	Positive
Culem (1988)	Bilateral FDI from 6 developed countries	6 developed countries	Positive
Moore (1993)	Bilateral FDI from US in manufacturing sector	17 developed countries	Positive
Bajo-Rubio and Sosvilla-Rivero (1994)	FDI from the rest of the world	1 developed country	Positive
Billington (1999)	FDI from the rest of the world	7 developed countries	Positive
Globerman and Shapiro (1999)	FDI from the rest of the world	1 developed country	Positive
Lipsey (2000)	FDI from the rest of the world	22 developed countries	Negative
Yang *et al.* (2000)	FDI from the rest of the world	1 developed country	Insignificant
Filippaios *et al.* (2003)	Bilateral FDI from US	4 developed countries	Negative (Australia and New Zealand) Positive (Japan

			and Korea)
Kottaridi (2005)	FDI from the rest of the world	10 developed countries	Positive
Wijeweera and Clark (2006)	FDI from the rest of the world	1 developed country	Positive
Ham and Kleiner (2007)	Bilateral FDI from 19 developed countries	19 developed countries	Insignificant
Wijeweera *et al.* (2007)	Bilateral FDI from 9 countries	1 developed country	Positive
Radulescu and Robson (2008)	FDI from the rest of the world	19 developed countries	Positive in 3 models and negative in 1 model
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Stevens (1969)	Bilateral FDI from US in manufacturing sector	4 developing countries	Positive (Argentina, Brazil, and Venezuela) Insignificant (Mexico)
Reuber *et al.* (1973)	Bilateral FDI from US in manufacturing sector	23 developing countries 109 developing countries	Positive
Schneider and Frey (1985)	FDI from the rest of the world	54 developing countries	Positive
Torrisi (1985)	FDI from the rest of the world	1 developing country	Positive
Shamsuddin (1994)	FDI from the rest of the world	36 developing countries	Positive
Tsai (1994)	FDI from the rest of the world	62 developing countries	Positive
Karier (1995)	Bilateral FDI from US in 32 industries	10 developed and developing countries	Positive
Singh and Jun (1995)	FDI from the rest of the world	31 developed and developing countries	Insignificant
Wang and Swain (1995)	FDI from the rest of the world	2 developing countries	Positive
Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Positive
Morisset (2000)	FDI from the rest of the world	71 developing countries	Positive
Bende-Nabende *et al.* (2001)	FDI from the rest of the world	5 developing countries	Positive (Indonesia) Insignificant

			(Malaysia, Philippines, Singapore and Thailand)
Obwona (2001)	FDI from the rest of the world	1 developing country	Positive
Globerman and Shapiro (2002)	FDI from the rest of the world	144 developed and developing countries	Positive
Kucera (2002)	FDI from the rest of the world	127 developed and developing countries	Positive
Trevino *et al.* (2002)	FDI from the rest of the world	7 developing countries	Positive
Bengoa and Sanchez-Robles (2003)	FDI from the rest of the world	18 developing countries	Positive
Campos and Kinoshita (2003)	FDI from the rest of the world	25 developing countries	Insignificant
Egger and Winner (2005)	FDI from the rest of the world	73 developed and developing countries	Positive
Gorg (2005)	Bilateral FDI from US	33 developed and developing countries	Insignificant
Grosse and Trevino (2005)	FDI from the rest of the world	13 developing countries	Positive
Asiedu (2006)	FDI from the rest of the world	22 developing countries	Positive
Fedderke and Romm (2006)	FDI from the rest of the world	1 developing country	Positive
Ramirez (2006)	FDI from the rest of the world	1 developing country	Positive
Benassy-Quere *et al.* (2007)	Bilateral FDI from 53 developed and developing countries	50 developed and developing countries	Positive
Greenaway *et al*. (2007)	FDI from the rest of the world	54 developing countries	Positive
Ang (2008)	FDI from the rest of the world	1 developing country	Positive
Dewit *et al.* (2009)	Bilateral FDI from 27 developed and developing countries	27 developed and developing countries	Positive
Leibrecht and Scharler (2009)	Bilateral FDI from 7 developed countries	7 developing countries	Positive
Fukumi and Nishijima (2010)	FDI from the rest of the world	19 developing countries	Positive
Source: Author's own work.			

Furthermore, economic growth can be seen as an indicator of future market potential in the host country, whereby higher rate of economic growth ensures long-term commitment by foreign investors as it leads to increase in income and consumer demand for goods and services (Noorbakhsh *et al.*, 2001). It also implies better infrastructure, provides greater incentive for inward FDI (Tsai, 1994) and influences positively the business climate for inward FDI (Morisset, 2000). Moreover, rapid growth may also give rise to the presence of economic rents that will encourage inward FDI (Globerman and Shapiro, 1999). Four empirical studies on developed countries indicate the beneficial impact of economic growth on inward FDI, while five studies on developed countries show evidence of no significant impact (see Table 3.8). However, Filippaios *et al.* (2003) find some evidence of a negative impact in Japan and Korea. They argue that fast growing host economies (Japan and Korea) generate a dynamic microeconomic environment such as cultural idiosyncrasy, which deters inward FDI. Therefore, we expect that economic growth positively affect inward FDI in developed host countries.

Table 3.8 The effect of economic growth in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Scaperlanda and Mauer (1969)	Bilateral FDI from US	European Economic Community (EEC)	Insignificant
Culem (1988)	Bilateral FDI from 6 developed countries	6 developed countries	Positive
Moore (1993)	Bilateral FDI from US in manufacturing sector	17 developed countries	Insignificant
Billington (1999)	FDI from the rest of the world	7 developed countries	Positive
Ford and Strange (1999)	520 Japanese firms' decision to invest abroad	7 developed countries	Insignificant
Lipsey (2000)	FDI from the rest of the world	22 developed countries	Positive
Filippaios *et al.* (2003)	Bilateral FDI from US	4 developed countries	Insignificant (Australia and New Zealand)

			Negative (Japan and Korea)
De Vita and Abbott (2007)	Bilateral FDI from 7 developed countries in manufacturing sector	1 developed country	Positive
Radulescu and Robson (2008)	FDI from the rest of the world	19 developed countries	Insignificant
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Schneider and Frey (1985)	FDI from the rest of the world	54 developing countries	Positive
Torrisi (1985)	FDI from the rest of the world	1 developing country	Insignificant
Tsai (1994)	FDI from the rest of the world	62 developing countries	Insignificant (1975-1978) Positive (1983-1986)
Singh and Jun (1995)	FDI from the rest of the world	31 developed and developing countries	Insignificant
Wang and Swain (1995)	FDI from the rest of the world	2 developing countries	Insignificant
Gastanaga *et al.* (1998)	FDI from the rest of the world	49 developing countries	Positive
Bende-Nabende *et al.* (2001)	FDI from the rest of the world	5 developing countries	Positive (Malaysia and Thailand) Negative (Indonesia, Philippines and Singapore)
Noorbakhsh *et al.* (2001)	FDI from the rest of the world	36 developing countries	Positive
Obwona (2001)	FDI from the rest of the world	1 developing country	Positive
Asiedu (2002)	FDI from the rest of the world	71 developing countries	Insignificant
Hsiao and Shen (2003)	FDI from the rest of the world	23 developing countries	Positive
Greenaway *et al.* (2007)	FDI from the rest of the world	54 developing countries	Insignificant
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Positive
Ang (2008)	FDI from the rest of the world	1 developing country	Positive
Moosa (2009)	FDI from the rest of the world	18 developing countries	Positive
Source: Author's own work.			

Agglomeration

Inward FDI may appear to cluster in certain locations, which is referred as an agglomeration effect (Shatz and Venables, 2000; Campos and Kinoshita, 2003). It is measured as the past level of inward FDI and is expected to be positively related with current level of inward FDI. There are several reasons why past investment influences the current investment. First, foreign investors acquire information on market and cost conditions in the host country through direct experience, which forms the basis for making new investments and results in continued investments by existing foreign investors (Kinoshita and Mody, 1997). Thus, foreign investors tend to favour familiar countries, and view investing in locations that they do not have enough knowledge of as risky decisions (Noorbakhsh *et al.*, 2001). In addition, foreign investors may lack knowledge about whether a country is a good location. Thus they view investment decisions by others as a good signal, locate where other foreign investors are operating and hope to benefit from the same opportunities. Moreover, clustering of inward FDI may be due to synergies among firms, linkages among projects, technology spillovers and R&D spillovers (Shatz and Venables, 2000; Obwona, 2001; Campos and Kinoshita, 2003). Finally, the herd effect may occur because of the supply and demand of intermediate inputs (Shatz and Venables, 2000; Campos and Kinoshita, 2003). Most empirical studies on developed countries find a positive effect of past inward FDI on current inward FDI. However, Yang *et al.* (2000) find an insignificant effect (see Table 3.9). Therefore, we expect that the past inward FDI and current inward FDI are positively related in developed host countries.

Table 3.9 The effect of agglomeration in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Ford and Strange (1999)	520 Japanese firms' decision to invest abroad	7 developed countries	Positive

Lipsey (2000)	FDI from the rest of the world	22 developed countries	Positive
Yang *et al.* (2000)	FDI from the rest of the world	1 developed country	Insignificant
De Vita and Abbott (2007)	Bilateral FDI from 7 developed countries in manufacturing sector	1 developed country	Positive
Radulescu and Robson (2008)	FDI from the rest of the world	19 developed countries	Positive
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Singh and Jun (1995)	FDI from the rest of the world	31 developed and developing countries	Positive
Gastanaga *et al.* (1998)	FDI from the rest of the world	49 developing countries	Positive
Noorbakhsh *et al.* (2001)	FDI from the rest of the world	36 developing countries	Positive
Campos and Kinoshita (2003)	FDI from the rest of the world	25 developing countries	Positive
Hsiao and Shen (2003)	FDI from the rest of the world	23 developing countries	Positive
Gorg (2005)	Bilateral FDI from US	33 developed and developing countries	Positive
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Negative
Bhaumik and Dimova (2009)	FDI from the rest of the world	86 developing countries	Positive
Source: Author's own work.			

Trade barrier and trade openness

FDI might be undertaken to gain access to the market in the host country because of trade barriers. So high trade barriers in the host country provide a disincentive for exports and an incentive for inward FDI (Scaperlanda and Mauer, 1969; Goldberg, 1972, Culem, 1988; Bajo-Rubio and Sosvilla-Rivero, 1994). Therefore, FDI is viewed as a substitute for trade and open economies should receive fewer inward FDI (Moosa, 2002). Empirical studies on developed countries seek to test this hypothesis, but fail to produce conclusive results. Eight studies find a positive impact of trade barrier on inward FDI, while six studies find an insignificant impact (see Table 3.10).

Table 3.10 The effect of trade barrier in the host country on inward FDI			
Studies on developed host countries			
Author	Data type	Host country	Results
Scaperlanda and Mauer (1969)	FDI from US	European Economic Community (EEC)	Insignificant
Goldberg (1972)	FDI from US	European Economic Community (EEC)	Insignificant
Schmitz and Bieri (1972)	FDI from US	European Economic Community (EEC)	Positive
Lunn (1980)	FDI from US	European Economic Community (EEC)	Positive
Lunn (1983)	FDI from US	European Economic Community (EEC)	Insignificant
Scaperlanda and Balough (1983)	Manufacturing FDI from US	European Economic Community (EEC)	Positive
Culem (1988)	Bilateral FDI from 6 developed countries	6 developed countries	Insignificant
Kogut and Chang (1991)	FDI from Japanese firms in 297 industries	1 developed country	Positive
Drake and Caves (1992)	Bilateral FDI from Japan in 102 industries	1 developed country	Positive
Moore (1993)	Bilateral FDI from Germany in manufacturing sector	17 developed countries	Insignificant
Bajo-Rubio and Sosvilla-Rivero (1994)	FDI from the rest of the world	1 developed country	Positive
Neven and Siotis (1996)	Bilateral FDI from US and Japan in 8 industries	4 developed countries	Bilateral FDI from US to 4 developed countries Positive Bilateral FDI from Japan to 4 developed countries Insignificant
Barrell and Pain (1999)	Bilateral FDI from Japan	7 developed countries	Positive
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Karier (1995)	Bilateral FDI from US in 32 industries	10 developed and developing countries	Positive
Wang and Swain (1995)	FDI from the rest of the world	2 developing countries	Insignificant (Hungary) Negative (China)

Gastanaga *et al.* (1998)	FDI from the rest of the world	49 developing countries	Insignificant
Bognanno *et al.* (2005)	Bilateral FDI from US in 7 industries	22 developed and developing countries	Positive
Source: Author's own work.			

However, more recent studies believe that trade openness might lead to a better business climate through enhanced expectations of economic growth prospects, whereby open economies may encourage more inward FDI (Lim, 2001). However, only one empirical study on developed countries supports the above hypothesis, while two studies on developed countries do not find any significant relationship. In addition, three studies on developed countries find that trade openness negatively influences inward FDI (see Table 3.11). For example, Filippaios *et al.* (2003) argue that the negative link between trade openness and inward FDI indicates that inward FDI is used to cater for the local market in the host countries, while Yang *et al.* (2000) argue that inward FDI is a substitute for trade and it is used to avoid trade barriers. Hence, we expect a positive or negative impact of trade openness on inward FDI.

Table 3.11 The effect of trade openness in the host country on inward FDI			
Studies on developed host countries			
Author	Data type	Host country	Results
Billington (1999)	FDI from the rest of the world	7 developed countries	Insignificant
Lipsey (2000)	FDI from the rest of the world	22 developed countries	Positive
Yang *et al.* (2000)	FDI from the rest of the world	1 developed country	Negative
Filippaios *et al.* (2003)	Bilateral FDI from US	4 developed countries	Negative
De Vita and Abbott (2007)	Bilateral FDI from 7 developed countries in manufacturing sector	1 developed country	Negative
Radulescu and Robson (2008)	FDI from the rest of the world	19 developed countries	Insignificant
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Singh and Jun	FDI from the rest of the	31 developed and	Positive

(1995)	world	developing countries	
Morisset (2000)	FDI from the rest of the world	71 developing countries	Positive
Bende-Nabende *et al.* (2001)	FDI from the rest of the world	5 developing countries	Positive
Noorbakhsh *et al.* (2001)	FDI from the rest of the world	36 developing countries	Positive
Asiedu (2002)	FDI from the rest of the world	71 developing countries	Positive
Kucera (2002)	FDI from the rest of the world	127 developed and developing countries	Positive
Greenaway *et al.* (2007)	FDI from the rest of the world	54 developing countries	Positive
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Insignificant
Ang (2008)	FDI from the rest of the world	1 developing country	Positive
Bhaumik and Dimova (2009)	FDI from the rest of the world	86 developing countries	Insignificant
Fukumi and Nishijima (2010)	FDI from the rest of the world	19 developing countries	Positive
Source: Author's own work.			

Exchange rate

Currency devaluation measured by the exchange rate is likely to encourage inward FDI in the host country as it makes the host country's assets undervalued, reduces the unit cost of the host country's factor of production and increases the relative wealth position of foreign investors (Froot and Stein, 1991; Globerman and Shapiro, 1999; Ramirez, 2006). However, the counter argument also holds that as foreign investors might take a depreciating domestic currency as a signal of future depreciation and thus reduce investment (Globerman and Shapiro, 1999). Moreover, Ramirez (2006) also argues that the appreciation of the domestic currency might attract inward FDI as it enhances the foreign currency value of the remittances of profits and dividends back to the parent company. Empirical studies on developed countries reach mixed conclusions about the effect of exchange rate on FDI. Four studies find a positive link, four studies find a negative link and four studies do not find a link between the two variables (see Table

3.12). Therefore, we expect that exchange rate has a positive or negative impact on inward FDI in developed host countries.

Table 3.12 The effect of exchange rate in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Slemrod (1989)	FDI from the rest of the world	1 developed country	Negative
Drake and Caves (1992)	Bilateral FDI from Japan in 102 industries	1 developed country	Positive
Pain (1993)	FDI from the rest of the world	1 developed country	Negative
Bajo-Rubio and Sosvilla-Rivero (1994)	FDI from the rest of the world	1 developed country	Negative in the short-run and insignificant in the long-run
Cooke (1997)	Bilateral FDI from US in 9 industries	19 developed countries	Positive
Globerman and Shapiro (1999)	FDI from the rest of the world	1 developed country	Positive
Yang *et al.* (2000)	FDI from the rest of the world	1 developed country	Insignificant
Wijeweera and Clark (2006)	FDI from the rest of the world	1 developed country	Insignificant
De Vita and Abbott (2007)	Bilateral FDI from 7 developed countries in manufacturing sector	1 developed country	Insignificant
Wijeweera *et al.* (2007)	Bilateral FDI from 9 developed countries	1 developed country	Positive
Radulescu and Robson (2008)	FDI from the rest of the world	19 developed countries	Negative
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Singh and Jun (1995)	FDI from the rest of the world	31 developed and developing countries	Negative
Wang and Swain (1995)	FDI from the rest of the world	2 developing countries	Positive (China) Insignificant (Hungary)
Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Positive
Kucera (2002)	FDI from the rest of the world	127 developed and developing countries	Insignificant
Trevino *et al.*	FDI from the rest of	7 developing	Insignificant

(2002)	the world	countries	
Grosse and Trevino (2005)	FDI from the rest of the world	13 developing countries	Negative
Ramirez (2006)	FDI from the rest of the world	1 developing country	Negative
Ang (2008)	FDI from the rest of the world	1 developing country	Negative

Source: Author's own work.
Note: An increase in exchange rate means a devaluation of the currency in the host country and a decrease in exchange rate means an appreciation of the currency in the host country.

Inflation rate

Inflation rate is used to capture macroeconomic instability and is expected to negatively influence inward FDI. According to de Mello (1997), high inflation rate increases the user cost of capital in the host country and negatively influences profitability of FDI. Two empirical studies on developed countries find a negative relationship between inflation rate and inward FDI (see Table 3.13). Therefore, we expect a negative impact of inflation rate on inward FDI in developed host countries.

Table 3.13 The effect of inflation rate in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Bajo-Rubio and Sosvilla-Rivero (1994)	FDI from the rest of the world	1 developed country	Negative
Yang *et al.* (2000)	FDI from the rest of the world	1 developed country	Negative
Studies on developing host countries			
Author	Data type	Host country	Results
Schneider and Frey (1985)	FDI from the rest of the world	54 developing countries	Negative
Obwona (2001)	FDI from the rest of the world	1 developing country	Insignificant
Asiedu (2002)	FDI from the rest of the world	71 developing countries	Insignificant
Trevino *et al.* (2002)	FDI from the rest of the world	7 developing countries	Negative
Bengoa and Sanchez-Robles (2003)	FDI from the rest of the world	18 developing countries	Negative
Campos and Kinoshita (2003)	FDI from the rest of the world	25 developing countries	Insignificant
Grosse and Trevino (2005)	FDI from the rest of the world	13 developing countries	Insignificant

Asiedu (2006)	FDI from the rest of the world	22 developing countries	Negative
Greenaway *et al.* (2007)	FDI from the rest of the world	54 developing countries	Insignificant
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Negative
Fukumi and Nishijima (2010)	FDI from the rest of the world	19 developing countries	Negative
Source: Author's own work.			

Corporate tax rate

Higher corporate tax rate has a disincentive effect on attracting inward FDI as it increases the cost of business (Hsiao and Shen, 2003) and lowers the return of investment (Fedderke and Romm, 2006). Looking at the empirical literature on developed countries, it is found to exert a negative effect on inward FDI in the majority of studies and is found to be insignificant in two studies (see Table 3.14). Therefore, we expect that corporate tax and inward FDI are negatively associated in developed host countries.

Table 3.14 The effect of corporate tax in the host country on inward FDI			
Studies on developed host countries			
Author	Data type	Host country	Results
Slemrod (1989)	FDI from the rest of the world	1 developed country	Negative
Cooke (1997)	Bilateral FDI from US in 9 industries	19 developed countries	Negative
Billington (1999)	FDI from the rest of the world	7 developed countries	Negative
Wijeweera and Clark (2006)	FDI from the rest of the world	1 developed country	Negative in the long run and insignificant in the short run
Wijeweera et al. (2007)	Bilateral FDI from 9 developed countries	1 developed country	Negative
Ham and Kleiner (2007)	Bilateral FDI from 19 developed countries	19 developed countries	Negative
Radulescu and Robson (2008)	FDI from the rest of the world	19 developed countries	Insignificant
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results

Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Negative
Gastanaga *et al.* (1998)	FDI from the rest of the world	49 developing countries	Negative
Hsiao and Shen (2003)	FDI from the rest of the world	23 developing countries	Negative
Bognanno *et al.* (2005)	Bilateral FDI from US in 7 industries	22 developed and developing countries	Insignificant
Gorg (2005)	Bilateral FDI from US	33 developed and developing countries	Negative
Javorcik and Spatareanu (2005)	FDI from 10,000 European firms	19 developed and developing countries	Negative
Fedderke and Romm (2006)	FDI from the rest of the world	1 developing country	Negative
Ang (2008)	FDI from the rest of the world	1 developing country	Negative
Leibrecht and Scharler (2009)	Bilateral FDI from 7 developed countries	7 developing countries	Negative
Source: Author's own work.			

Human capital

The quality of labour force is supposed to be a positive determinant of FDI location decision. Campos and Kinoshita (2003) argue that it is easier for local educated workers to learn new technology and it costs less for foreign investors to train local educated workers. However, empirical studies on developed countries use different measures of human capital such as the average years of education by Cooke (1997), the number of students in upper secondary education as a percentage of total population by Ford and Strange (1999) and high school graduation rate by Ham and Kleiner (2007). All three studies on developed countries support the hypothesis that good human capital attracts inward FDI (see Table 3.15). Therefore, we expect a positive correlation between human capital and inward FDI in developed host countries.

Table 3.15 The effect of human capital in the host country on inward FDI			
Studies on developed host countries			
Author	Data type	Host country	Results
Cooke (1997)	FDI from US in 9 industries	19 developed countries	Positive
Ford and	FDI from 520	7 developed	Positive

Strange (1999)	Japanese firms	countries	
Ham and Kleiner (2007)	Bilateral FDI from 19 developed countries	19 developed countries	Positive
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Schneider and Frey (1985)	FDI from the rest of the world	54 developing countries	Insignificant
Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Positive
Morisset (2000)	FDI from the rest of the world	71 developing countries	Insignificant
Bende-Nabende *et al.* (2001)	FDI from the rest of the world	5 developing countries	Positive (Malaysia, Singapore and Thailand) Negative (Philippines) Insignificant (Indonesia)
Noorbakhsh *et al.* (2001)	FDI from the rest of the world	36 developing countries	Positive
Globerman and Shapiro (2002)	FDI from the rest of the world	144 developed and developing countries	Positive
Kucera (2002)	FDI from the rest of the world	127 developed and developing countries	Insignificant
Campos and Kinoshita (2003)	FDI from the rest of the world	25 developing countries	Insignificant
Hsiao and Shen (2003)	FDI from the rest of the world	23 developing countries	Insignificant
Egger and Winner (2005)	FDI from the rest of the world	73 developed and developing countries	Positive
Asiedu (2006)	FDI from the rest of the world	22 developing countries	Positive
Bhaumik and Dimova (2009)	FDI from the rest of the world	86 developing countries	Insignificant
Moosa (2009)	FDI from the rest of the world	18 developing countries	Positive
Source: Author's own work.			

Infrastructure

Good infrastructure development increases the attractiveness of countries to inward FDI as it lowers transaction costs (Fedderke and Romm, 2006), increases the productivity of investments (Asiedu, 2002) and is therefore seen as a necessary condition for foreign

investors to operate successfully (Peck, 1996). However, the empirical studies on developed countries find the impact of infrastructure insignificant (see Table 3.16). Wijeweera *et al.* (2007) argue that developed countries have good infrastructure, so foreign investors do not consider it as an important factor when investing in developed countries. Therefore, we expect an insignificant effect of infrastructure on inward FDI in developed host countries.

Table 3.16 The effect of infrastructure in the host country on inward FDI

Studies on developed host countries			
Author	Data type	Host country	Results
Billington (1999)	FDI from the rest of the world	7 developed countries	Insignificant
Wijeweera *et al.* (2007)	Bilateral FDI from 9 developed countries	1 developed country	Insignificant
Studies on developing host countries			
Author	Data type	Host country	Results
Morisset (2000)	FDI from the rest of the world	71 developing countries	Insignificant
Bende-Nabende *et al.* (2001)	FDI from the rest of the world	5 developing countries	Positive (Indonesia, Philippines, Singapore and Thailand) Insignificant (Malaysia)
Asiedu (2002)	FDI from the rest of the world	71 developing countries	Positive
Bengoa and Sanchez-Robles (2003)	FDI from the rest of the world	18 developing countries	Insignificant
Campos and Kinoshita (2003)	FDI from the rest of the world	25 developing countries	Insignificant
Hsiao and Shen (2003)	FDI from the rest of the world	23 developing countries	Positive
Asiedu (2006)	FDI from the rest of the world	22 developing countries	Positive
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Insignificant
Ang (2008)	FDI from the rest of the world	1 developing country	Positive
Moosa (2009)	FDI from the rest of the world	18 developing countries	Insignificant

Source: Author's own work.

Political instability or country risk

A country with higher risk or instability is less appealing to FDI. Political instability or country risk may disrupt the economic process (Schneider and Frey, 1985), create uncertainty (Grosse and Trevino, 2005; Fedderke and Romm, 2006), cause unexpected modifications of the legal and fiscal frameworks (Moosa, 2002) and incur higher costs to foreign investors (Trevino *et al.*, 2002; Grosse and Trevino, 2005). Therefore it lowers the return to foreign investors and is predicted to be a deterrent to FDI. However, there is no empirical study on the effect of political instability or country risk on inward FDI in developed countries (see Table 3.17). The possible reason is that developed countries are politically stable, so it is not a crucial factor influencing the amount of inward FDI. Therefore, we expect that political instability or country risk does not have a significant impact on inward FDI in developed countries.

Table 3.17 The effect of political instability or country risk in the host country on inward FDI

Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Schneider and Frey (1985)	FDI from the rest of the world	54 developing countries	Negative
Singh and Jun (1995)	FDI from the rest of the world	31 developed and developing countries	Negative
Wang and Swain (1995)	FDI from the rest of the world	2 developing countries	Negative
Cooke and Noble (1998)	Bilateral FDI from US in 9 industries	33 developed and developing countries	Insignificant
Gastanaga *et al.* (1998)	FDI from the rest of the world	49 developing countries	Negative
Noorbakhsh *et al.* (2001)	FDI from the rest of the world	36 developing countries	Insignificant
Asiedu (2002)	FDI from the rest of the world	71 developing countries	Insignificant
Trevino *et al.* (2002)	FDI from the rest of the world	7 developing countries	Insignificant
Grosse and Trevino (2005)	FDI from the rest of the world	13 developing countries	Negative
Asiedu (2006)	FDI from the rest of the world	22 developing countries	Negative
Fedderke and	FDI from the rest	1 developing country	Negative

Romm (2006)	of the world		
Ramirez (2006)	FDI from the rest of the world	1 developing country	Negative
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Negative
Moosa (2009)	FDI from the rest of the world	18 developing countries	Negative
Leibrecht and Scharler (2009)	Bilateral FDI from 7 developed countries	7 developing countries	Insignificant
Source: Author's own work.			

Corruption and rule of law

Host country institutions assess business operation conditions in the host country and influence investment decisions. Corruption is expected to deter FDI as it creates uncertainty, raises the cost and reduces the profit of foreign firms (Egger and Winner, 2005; Grosse and Trevino, 2005). In addition, it reduces the productivity of public inputs (Egger and Winner, 2005). Rule of law measures the strength and impartiality of the legal system (Campos and Kinoshita, 2003; Asiedu, 2006). Therefore, inward FDI is attracted to countries with better legal systems. Turning to the empirical literature, there are no studies on the association between corruption or rule of law and inward FDI in developed countries (see Tables 3.18 and 3.19). Developed countries have good legal systems and low corruption, so they are not important determinants of inward FDI. Therefore, we expect that corruption or rule of law does not significantly affect inward FDI in developed host countries.

Table 3.18 The effect of corruption in the host country on inward FDI			
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Gastanaga *et al.* (1998)	FDI from the rest of the world	49 developing countries	Negative
Hsiao and Shen (2003)	FDI from the rest of the world	23 developing countries	Negative
Bognanno *et al.* (2005)	Bilateral FDI from US in 7 industries	22 developed and developing countries	Negative
Egger and	FDI from the rest of the	73 developed and	Negative

Winner (2005)	world	developing countries	
Grosse and Trevino (2005)	FDI from the rest of the world	13 developing countries	Negative
Asiedu (2006)	FDI from the rest of the world	22 developing countries	Negative
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Insignificant
Bhaumik and Dimova (2009)	FDI from the rest of the world	86 developing countries	Insignificant
Source: Author's own work.			

Table 3.19 The effect of rule of law in the host country on inward FDI			
Studies on developing host countries or a mix of developed and developing host countries			
Author	Data type	Host country	Results
Campos and Kinoshita (2003)	FDI from the rest of the world	25 developing countries	Positive
Grosse and Trevino (2005)	FDI from the rest of the world	13 developing countries	Positive
Egger and Winner (2005)	FDI from the rest of the world	73 developed and developing countries	Positive
Asiedu (2006)	FDI from the rest of the world	22 developing countries	Positive
Naude and Krugell (2007)	FDI from the rest of the world	43 developing countries	Positive in 1 model and negative in 1 model
Bhaumik and Dimova (2009)	FDI from the rest of the world	86 developing countries	Insignificant
Source: Author's own work.			

3.2.2.5.5 Home country factors that affect outward FDI

Kyrkilis and Pantelidis (2003) argue that a country's outward FDI positively depends on domestic firms' ability to acquire and utilise internally income yielding assets. Furthermore, firms' ability is a function of home country specific assets or characteristics, such as national income, exchange rate, human capital, openness of the economy and so on. Hence, outward FDI can be considered as a function of home country specific characteristics (Kyrkilis and Pantelidis, 2003). Moreover, Lipsey (2000) believes that the determinants of outward FDI are the same economic characteristics as those of inward FDI. Furthermore, Globerman and Shapiro (1999, 2002) argue that inward FDI and outward FDI are symmetrical and the same factors that attract foreign

firms into a country may also encourage domestic firms to invest abroad. Therefore, we incorporate all the factors that might influence inward FDI to examine the determinants of outward FDI including labour cost, trade union density, employment protection legislation, wage bargaining coordination, R&D expenditure, market size, economic growth, agglomeration, trade barrier, trade openness, exchange rate, inflation rate, corporate tax, human capital, infrastructure, political instability, country risk, corruption and rule of law.

Labour cost

High labour cost in the home country can be an important motivation for outward FDI as the domestic firms tend to invest abroad to reduce the cost of production and home country becomes less attractive to domestic firms (Globerman and Shapiro, 1999; Banga, 2007). However, the relationship could be positive if higher labour cost reflects a higher labour skill level (Noorbakhsh *et al.*, 2001). Three studies on developed countries confirm a positive linkage between labour cost and outward FDI (see Table 3.20). Therefore, based on economic theory and empirical literature, we expect that labour cost positively or negatively affects outward FDI in developed home countries.

Table 3.20 The effect of labour cost in the home country on outward FDI

Studies on developed home countries			
Author	Data type	Home country	Results
Cushamn (1987)	Bilateral FDI to 5 developed countries	1 developed country	Positive
Barrell and Pain (1996)	FDI of a sample of American firms to the rest of the world	1 developed country	Positive
Globerman and Shapiro (1999)	FDI to the rest of the world	1 developed country	Positive
Studies on developing home countries			
Author	Data type	Home country	Results
Banga (2007)	FDI to the rest of the world	13 developing countries	Positive

Source: Author's own work.

Union density

Karier (1995) argues that strong unions in the home country might encourage outward FDI as they raise wages, increase production costs and create a comparative disadvantage in the home country. However, the relationship can be negative if unions raise productivity, which offsets higher wages (Karier, 1995). Only one empirical study on developed countries addresses this issue and does not find any significant relationship between the two variables (see Table 3.21). Therefore, based on economic theory and empirical literature, we expect a positive or negative impact of trade union density on outward FDI in developed home countries.

Table 3.21 The effect of union density in the home country on outward FDI

Studies on developed home countries			
Author	Data type	Home country	Results
Karier (1995)	Bilateral FDI to 10 developed and developing countries in 32 industries	1 developed country	Insignificant
Studies on developing home countries			
Author	Data type	Home country	Results
Banga (2007)	FDI to the rest of the world	13 developing countries	Insignificant

Source: Author's own work.

Employment protection legislation

According to Dewit *et al.* (2009), employment protection restriction in the home country incurs employment adjustment costs for domestic firms and provides an impetus for outward FDI. On the other hand, rigid domestic employment protection legislation may help the home country retain domestic firms, increase domestic employment, thus reduce outward FDI (Dewit *et al.*, 2009). Turning to the empirical literature on developed countries, Benassy-Quere *et al.* (2007) suggest that employment protection legislation in the home country does not have a significant impact on outward FDI. Another study by Dewit *et al.* (2009) finds that employment protection rigidity in the home country can help to anchor domestic firms and make them reluctant to invest

abroad (see Table 3.22). Therefore, based on economic theory and empirical literature, we expect a positive or negative association between employment protection legislation and outward FDI in developed home countries.

Table 3.22 The effect of employment protection legislation in the home country on outward FDI

Studies on a mix of developed and developing home countries			
Author	Data type	Home country	Results
Benassy-Quere *et al.* (2007)	Bilateral FDI to 50 developed and developing countries	53 developed and developing countries	Insignificant
Dewit *et al.* (2009)	Bilateral FDI to 27 developed and developing countries	27 developed and developing countries	Negative

Source: Author's own work.
Note: A high index shows a rigid employment protection legislation.

Bargaining coordination

In terms of bargaining coordination, Radulescu and Robson (2008) believe that firms tend to decide their own firm-level wages and employment conditions. Therefore, countries with coordinated wage bargaining are more likely to get involved in outward FDI. However, outward FDI might be lower in countries with coordinated wage bargaining system as it might secure a lower rate of growth in aggregate real wages, reduce labour turnover and decrease labour recruitment costs (Whyman *et al.*, 2008). For empirical studies in relation to outward FDI and bargaining coordination, there is no study on this topic. Therefore, based on economic theory, we expect that coordinated wage bargaining system positively or negatively affects outward FDI in developed home countries.

R&D expenditure

According to the notion of ownership advantages in the eclectic paradigm, a firm sets up its production facilities abroad through FDI to exploit its ownership advantages such

as advanced technology, marketing and management expertise, etc. Hence, FDI transfers technology from the home country to the host country. For example, R&D expenditure leads to the creation of advanced technology (Kogut and Chang, 1991). Therefore, outward FDI and R&D expenditure in the home country are positively correlated. However, the motive of foreign investors to invest in a host country might be to access technology in the host country and transfer it to the home country. In that case, outward FDI and R&D expenditure in the home country might be negatively associated. Three empirical studies on developed countries find that R&D expenditure in the home country and outward FDI are positively correlated. However, no correlation is observed by Vannoni (1999) (see Table 3.23). Therefore, based on economic theory and empirical literature, we expect that R&D expenditure has a positive or negative impact on outward FDI in developed home countries.

Table 3.23 The effect of R&D expenditure in the home country on outward FDI

Studies on developed home countries			
Author	Data type	Home country	Results
Kogut and Chang (1991)	Bilateral FDI to US in 297 industries	1 developed country	Positive
Drake and Caves (1992)	Bilateral FDI to US in 102 industries	1 developed country	Positive
Vannoni (1999)	Bilateral FDI to 10 developed countries	1 developed country	Insignificant
Love (2003)	Bilateral FDI to 7 developed countries in 8 industries	1 developed country	Positive
Studies on developing home countries			
Author	Data type	Home country	Results
Lin and Yeh (2005)	FDI to the rest of world in 1 industry	1 developing country	Positive

Source: Author's own work.

Market size and economic growth

Market size and economic growth are positively related with outward FDI. With higher economic performance and development, the banks in the home country are able to provide more loans for firms to invest abroad (Wang and Wong, 2007). According to

the investment-development path model, the outward FDI increases as the economy becomes more developed. Firms are more likely to develop their ownership advantages in terms of economies of scale in the production, improvement of marketing expertise, invention and adoption of new technology etc. These are competitive advantages for firms to undertake foreign production (Globerman and Shapiro, 1999; Kyrkilis and Pantelidis, 2003; Kueh *et al.*, 2009). Most studies on developed countries find positive effects of market size and economic growth on outward FDI. However, Lipsey (2000) finds that large countries invest less FDI abroad, while rich countries invest more (see Tables 3.24 and 3.25). Therefore, based on economic theory and empirical literature, we expect that market size and economic growth have positive impacts on outward FDI in developed home countries.

Table 3.24 The effect of market size variables in the home country on outward FDI

Studies on developed home countries			
Author	Data type	Home country	Results
Globerman and Shapiro (1999)	FDI to the rest of the world	1 developed country	Positive
Lipsey (2000)	FDI to the rest of the world	22 developed countries	Negative
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	5 developed countries	Positive
Wang and Wong (2007)	FDI to the rest of the world	25 developed countries	Positive
Leibrecht and Scharler (2009)	Bilateral FDI to 7 developing countries	7 developed countries	Positive
Studies on developing home countries or a mix of developed and developing home countries			
Author	Data type	Home country	Results
Globerman and Shapiro (2002)	FDI to the rest of the world	144 developed and developing countries	Positive
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	4 developing countries	Positive (Brazil) Insignificant (Korea, Singapore and Argentina)
Wang and Wong (2007)	FDI to the rest of the world	20 developing countries	Positive
Banga (2007)	FDI to the rest of the world	13 developing countries	Insignificant

Benassy-Quere *et al.* (2007)	Bilateral FDI to 50 developed and developing countries	53 developed and developing countries	Positive
Dewit *et al.* (2009)	Bilateral FDI to 27 developed and developing countries	27 developed and developing countries	Positive
Kueh *et al.* (2009)	FDI to the rest of the world	1 developing country	Positive
Williams (2009)	FDI to the rest of the world	15 developing countries	Positive
Source: Author's own work.			

Table 3.25 The effect of market potential in the home country on outward FDI			
Studies on developed home countries			
Author	Data type	Home country	Results
Lipsey (2000)	FDI to the rest of the world	22 developed countries	Positive
Studies on developing home countries			
Author	Data type	Home country	Results
Williams (2009)	FDI to the rest of the world	15 developing countries	Positive
Source: Author's own work.			

Past level of outward FDI

Past level of outward FDI might positively affect the current level of outward FDI. There are several reasons why past investment influences the current investment. First, domestic investors acquire information on market and cost conditions in a foreign country through direct experience, which forms the basis for making new investments and results in continued investments by existing investors in the same foreign location (Kinoshita and Mody, 1997). Moreover, the positive effect may be due to synergies among firms, linkages among projects, technology spillovers, R&D spillovers, the supply and demand of intermediate inputs (Shatz and Venables, 2000; Obwona, 2001; Campos and Kinoshita, 2003). Three empirical studies on developed countries confirm the positive impact. However, Shapiro (1980) fails to find a significant link between the two variables (see Table 3.26). Therefore, we expect that past level of outward FDI and current level of outward FDI are positively related.

Table 3.26 The effect of past level of outward FDI in the home country on current level of outward FDI			
Studies on developed home countries			
Author	Data type	Home country	Results
Shapiro (1980)	FDI to the rest of the world	1 developed country	Insignificant
Lipsey (2000)	FDI to the rest of the world	22 developed countries	Positive
Gorg (2005)	Bilateral FDI to 33 developed and developing countries	1 developed country	Positive
De Vita and Abbott (2007)	Bilateral FDI to UK in manufacturing sector	7 developed countries	Positive
Source: Author's own work.			

Trade Openness

Trade openness in the home country is quite often measured as the sum of imports and exports as a percentage of GDP and it is positively related with outward FDI. Higher levels of exports enable firms to get access to foreign markets, to acquire information about foreign markets and to get knowledge about organizing foreign operations. Therefore, the uncertainty and risk of outward FDI are reduced (Kyrkilis and Pantelidis, 2003; Banga, 2007; Kueh *et al.*, 2009). Higher levels of imports may increase the competition between foreign firms and domestic firms. Thus, it may encourage domestic firms to invest in foreign countries where production cost is lower and market size is larger (Banga, 2007). However, the effect of trade openness could be negative if exports and outward FDI are substitutes. In terms of empirical literature on developed countries, three studies find that trade openness encourages outward FDI, while Kyrkills and Pantelidis (2003) do not find a significant relationship between the two variables in France, Italy, Netherlands and UK (see Table 3.27). Therefore, based on economic theory and empirical literature, we expect a positive or negative association between trade openness and outward FDI in developed home countries.

Table 3.27 The effect of trade openness in the home country on outward FDI			
Studies on developed home countries			
Author	Data type	Home country	Results
Lipsey (2000)	FDI to the rest of the world	22 developed countries	Positive
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	5 developed countries	Positive (Germany) Insignificant (France, Italy, Netherlands and UK)
Wang and Wong (2007)	FDI to the rest of the world	25 developed countries	Positive
Studies on developing home countries			
Author	Data type	Home country	Results
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	4 developing countries	Positive (Korea and Argentina) Insignificant (Brazil and Singapore)
Wang and Wong (2007)	FDI to the rest of the world	20 developing countries	Positive
Kueh *et al.* (2009)	FDI to the rest of the world	1 developing country	Positive
Source: Author's own work.			

Exchange rate

Currency appreciation in the home country might lead to an increase in outward FDI. It reduces costs of acquiring foreign assets in domestic currency units, helps firms raise capital easier (Kyrkilis and Pantelidis, 2003; Wang and Wong, 2007). In addition, it might reduce the incentive for exports, thus increasing the motive for foreign investments (Kyrkilis and Pantelidis, 2003). However, Globerman and Shapiro (1999) argue that the relationship could be opposite. Currency depreciation in the home country may be viewed as a signal of future depreciation leading to more investment abroad. The empirical studies on developed countries have failed to produce conclusive results. Two studies find a positive impact of exchange rate on outward FDI, five studies find a negative impact and three studies do not find any significant impact (see Table 3.28). Therefore, we expect that exchange rate positively or negatively influences outward FDI in developed home countries.

Table 3.28 The effect of exchange rate in the home country on outward FDI			
Studies on developed home countries			
Author	Data type	Home country	Results
Drake and Caves (1992)	Bilateral FDI to US in 102 industries	1 developed country	Negative
Barrell and Pain (1996)	FDI of a sample of American firms to the rest of the world	1 developed country	Negative in short-run and positive in long-run
Globerman and Shapiro (1999)	FDI to the rest of the world	1 developed country	Insignificant
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	5 developed countries	Positive (Germany and UK) Negative (France) Insignificant (Italy and Netherlands)
De Vita and Abbott (2007)	Bilateral FDI to UK in manufacturing sector	7 developed countries	Insignificant
Wang and Wong (2007)	FDI to the rest of the world	25 developed countries	Negative
Wijeweera *et al.* (2007)	Bilateral FDI to US	9 developed countries	Negative
Studies on developing home countries			
Author	Data type	Home country	Results
Lin and Szenberg (1998)	FDI to the rest of the world	1 developing country	Negative
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	4 developing countries	Positive (Argentina) Negative (Brazil and Singapore) Insignificant (Korea)
Wang and Wong (2007)	FDI to the rest of the world	20 developing countries	Insignificant
Kueh *et al.* (2009)	FDI to the rest of the world	1 developing country	Positive

Source: Author's own work.
Note: An increase in exchange rate means depreciation of the currency in the home country and a decrease in exchange rate means appreciation of the currency in the home country.

Inflation rate

A high inflation rate in the home country may encourage outward FDI as it increases production cost in the home market (Williams, 2009) and lowers real return from domestic investment (Wang and Wong, 2007). However, only one study on developed

countries finds evidence of the above hypothesis, while another study on developed countries finds that the relationship between the two variables is insignificant (see Table 3.29). Therefore, we expect that inflation rate and outward FDI are positively correlated in developed home countries.

Table 3.29 The effect of inflation rate in the home country on outward FDI			
Studies on developed home countries			
Author	Data type	Home country	Results
Shapiro (1980)	FDI to the rest of the world	1 developed country	Insignificant
Wang and Wong (2007)	FDI to the rest of the world	25 developed countries	Positive
Studies on developing home countries			
Author	Data type	Home country	Results
Wang and Wong (2007)	FDI to the rest of the world	20 developing countries	Insignificant
Source: Author's own work.			

Corporate tax rate

High corporate tax rate in the home country reduces the after-tax rate of return to domestic firms, which leads them to invest abroad (Wijeweera *et al.*, 2007). There is only one empirical study on developed countries, which confirms the positive impact of corporate tax (see Table 3.30). Therefore, we expect that corporate tax rate positively influences outward FDI in developed home countries.

Table 3.30 The effect of corporate tax in the home country on outward FDI			
Studies on developed home countries			
Author	Data type	Home country	Results
Wijeweera *et al.* (2007)	Bilateral FDI to US	9 developed countries	Positive
Studies on developing home countries			
Author	Data type	Home country	Results
Banga (2007)	FDI to the rest of the world	13 developing countries	Positive
Source: Author's own work.			

Human capital

Good human capital in the home country gives the domestic firms the ability to acquire competitive advantage to invest abroad (Kyrkilis and Pantelidis, 2003). In addition, Banga (2007) believes that human capital indicates the capability of domestic firms and countries with higher levels of human capital undertake higher investment abroad. There is only one empirical study on developed countries, which confirms the beneficial effect of human capital (see Table 3.31). Therefore, we expect a positive effect of human capital on outward FDI in developed home countries.

Table 3.31 The effect of human capital in the home country on outward FDI

Studies on developed home countries			
Author	Data type	Home country	Results
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	5 developed countries	Positive
Studies on developing home countries or a mix of developed and developing home countries			
Author	Data type	Home country	Results
Globerman and Shapiro (2002)	FDI to the rest of the world	144 developed and developing countries	Insignificant
Kyrkilis and Pantelidis (2003)	FDI to the rest of the world	4 developing countries	Insignificant
Banga (2007)	FDI to the rest of the world	13 developing countries	Positive
Williams (2009)	FDI to the rest of the world	15 developing countries	Insignificant

Source: Author's own work.

Infrastructure

Banga (2007) argues that low availability of infrastructure in the home country is associated with high infrastructure cost leading to high level of outward FDI. However, there are no empirical studies on developed countries addressing this issue (see Table 3.32). The possible reason is that developed countries have good infrastructure, so we do not expect that infrastructure has a significant impact on outward FDI in developed home countries.

Table 3.32 The effect of infrastructure in the home country on outward FDI			
Studies on developing home countries			
Author	Data type	Home country	Results
Banga (2007)	FDI to the rest of the world	13 developing countries	Negative
Source: Author's own work.			

Corruption

Higher corruption level in the home country increases the cost of doing business and stimulates domestic firms to relocate production processes abroad to generate some cost savings (Williams, 2009). Therefore, a high level of corruption level in the home country is associated with a high level of outward FDI. However, there is no empirical literature on developed countries examining the relationship between the two variables probably because developed countries have low corruption levels (see Table 3.33). Therefore we expect that corruption is not a significant determinant of outward FDI in developed home countries.

Table 3.33 The effect of corruption in the home country on outward FDI			
Studies on developing home countries			
Author	Data type	Home country	Results
Williams (2009)	FDI to the rest of the world	15 developing countries	Positive
Source: Author's own work.			

Other variables

High political instability, high country risk and weak legal system in the home country might encourage domestic firms to invest abroad. However, there are no empirical studies investigating the impacts of them on outward FDI probably due to the fact that developed countries have good legal system and are politically stable. Therefore, they are not treated as crucial factors affecting outward FDI and we expect that political instability, country risk and rule of law do not have significant effects on outward FDI in developed home countries.

3.3 Theories of the relationship between FDI and economic growth and empirical literature

This section presents the economic theories on the impact of aggregate inward/outward FDI on host/home country's economic growth and the impact of host/home country's economic growth on the amount of aggregate inward/outward FDI. In addition, this section also summarizes the findings of empirical studies on the relationship between inward/outward FDI and host/home country's economic growth using aggregate country level data.

3.3.1 The impact of inward FDI on host country's economic growth

3.3.1.1 Neoclassical growth theory

According to the neoclassical growth model, output is a function of labour and capital, technology is considered as an exogenous factor (Barro and Sala-i-Martin, 1995). Inward FDI is a driving force of growth as it increases capital accumulation in the host country. However, it only has short-run effect on economic growth (Ericsson and Irandoust, 2001; Asheghian, 2004).

3.3.1.2 Endogenous growth theory

Consequently, the research on the long-run impact of inward FDI on growth has led to the endogenous growth theory, which emphasizes the importance of knowledge and technology in the economic growth process and postulates that technological change is an endogenous determinant of economic growth (Barro and Sala-i-Martin, 1995). Inward FDI increases long-run economic growth not only through capital accumulation, but also through technological progress. Inward FDI can make a positive contribution to the host country by supplying advanced technology, product and process innovations (Dunning, 1994; Whyman *et al.*, 2008). The entry of foreign firms might stimulate domestic firms to protect their market shares and profits, which leads to severe

competition, low price, wide consumer choice and high quality standards in the host country (Dunning, 1994; Blomstrom and Kokko, 1997; OECD, 2002; Hill, 2009). Increased competition may force local firms to use resources more efficiently, to develop product and process innovation and to promote technological upgrading, etc (Zhang, 2001; OECD, 2002; Ozturk, 2007; Hill, 2009). Therefore, the productivity of local firms can be improved by imitating the more advanced technology brought by inward FDI, by exploiting existing technology and resources more efficiently or by seeking for more advanced technology (Blomstrom and Kokko, 1997, Saggi, 2000; Ozturk, 2007). Furthermore, inward FDI may create forward and backward linkages as foreign firms transfer technology to local suppliers of intermediate goods and customers (Blomstrom and Kokko, 1997; Saggi, 2000; Zhang, 2001; OECD, 2002).

Inward FDI may enhance human capital in the host country by introducing the host country management practices, organizational and marketing techniques (de Mello, 1999; Ericsson and Irandoust, 2001). The foreign firms might provide managerial and working training to their employees. The important information can be transferred to the host country as domestic employees move from foreign to local firms or set up their own businesses (Blomstrom and Kokko, 1997; Saggi, 2000; OECD, 2002; Meier and Rauch, 2005; Hill, 2009). Additionally, the superior skills of foreign firms may stimulate local firms to improve or develop their own skills (Hill, 2009).

3.3.1.3 Other impacts on the host country

Inward FDI can increase the level of employment in the host country (Baker, 1999; Hill, 2009; Salvatore, 2012). Another benefit is that it improves the efficiency of resource allocation in the host country by engaging in the economic activities where the host country has a comparative advantage (Dunning, 1994; Whyman *et al.*, 2008). In

addition, the increased competition and demonstration effects encourage domestic firms to use resources more efficiently (Blomstrom and Kokko, 1997; OECD, 2002). Moreover, Inward FDI improves the balance of payments in the host country if inward FDI and imports are substitutes (Hill, 2009). Another benefit to the balance of payments arises when foreign firms undertake production in the host country and export products to other countries (Dunning, 1994; Hill, 2009). Furthermore, the host country can gain through tax revenue from foreign profits (Dunning, 1994; Blomstrom and Kokko, 1997). Finally, inward FDI has the potential to bring environmental benefits to the host country by introducing good practices and clean technologies (OECD, 2002).

Alternatively, there is a risk that foreign technology and working practices cannot accommodate local capacities and needs (Dunning, 1994). Additionally, inward FDI may transfer the host country's advanced technology to the home country, resulting in a reduction in the comparative advantages of the host country (Dunning, 1994). Another potential drawback is that foreign firms might out-compete local firms and drive local firms out of business, which might lead to foreign firms establish monopolies and raise prices in the host country's market (Blomstrom and Kokko, 1997; Hill, 2009). Moreover, the balance of payments in the host country may be deteriorated if the repatriated profits to the home country are more than the initial capital investment in the host country (Hill, 2009) or if inward FDI promotes imports and limits exports in the host country (Dunning, 1994; Hill, 2009). In addition, foreign firms may try to lower tax paid to the host country through transfer pricing manipulation (Dunning, 1994; Blomstrom and Kokko, 1997). Finally, inward FDI might bring harmful impact on the host country's environment, especially in the extractive and heavy industries (OECD, 2002).

3.3.2 The impact of outward FDI on home country's economic growth

Technology sourcing might be an important motivation behind outward FDI (Neven and Siotis, 1996; Love, 2003). Home countries can benefit from potential spillovers if the firms that invest abroad access the superior technology, organizational and management techniques in the foreign countries and transfer them back to the home country (Dunning, 1994; Hill, 2009). Additionally, it may facilitate the formation of inter-firm networking and cross-border cooperative alliances, which will benefit the home country (Dunning, 1994).

Outward FDI can also exert a positive influence on home country's economic growth in the following channels. First, outward FDI facilitates firms in the home countries to get access to the global market and to expand production/sales in the foreign markets (Dunning, 1994; O'Connor *et al.*, 1998; Wang and Wong, 2007). Second, it can help firms in the home country avoid domestic competition and compete with foreign firms (O'Connor *et al.*, 1998). Third, the profits earned by the firms abroad can be repatriated to the home country, benefiting its economic development (O'Connor *et al.*, 1998). Moreover, outward FDI may secure raw materials and resources supplies in the foreign country and avoid trade barriers to the foreign market (Dunning, 1994; Baker, 1999; Salvatore, 2012). In addition, outward FDI may help the home country reduce the production costs and increase production efficiency. Finally, the home country's balance of payments can be improved if the inward flow of foreign profits is more than the initial outward investment (Hill, 2009). Furthermore, if outward FDI requires the home country to export inputs, intermediate goods, capital equipment etc to the foreign countries, it will benefit the balance of payments in the home country (Hill, 2009). The

increased exports will have a positive impact on the employment level in the home country (O'Connor *et al.*, 1998; Hill, 2009; Williams, 2009).

In contrast, one harmful effect of outward FDI on the home country is the loss of domestic jobs (Salvatore, 2012). Furthermore, the unemployment level increases if outward FDI is a substitute for exports (O'Connor *et al.*, 1998; Hill, 2009). In addition, outward FDI might have a detrimental effect on the balance of payments in the home country. The balance of payments suffers if the initial outward capital investment is more than the subsequent inward foreign profits. The situation will get worse if outward FDI and exports are substitutes (Hill, 2009). Moreover, multinational firms can avoid domestic monetary policies due to their access to international capital markets, which might create difficulties on government control over the home country's economy (Salvatore, 2012). Finally, there are costs of adjusting to local language and culture, adapting to local business practices and customer needs, learning about the quality of local infrastructure etc (Dunning, 1994).

3.3.3 The impact of economic growth on inward/outward FDI

The previous section discussed the possible effects of inward/outward FDI on host/home country's economic growth. However, there might be a reverse relationship from economic growth to inward/outward FDI. Ignoring the feedback relationship might lead to biased empirical results and restrict the dynamics (Kim and Seo, 2003).

3.3.3.1 Investment development path

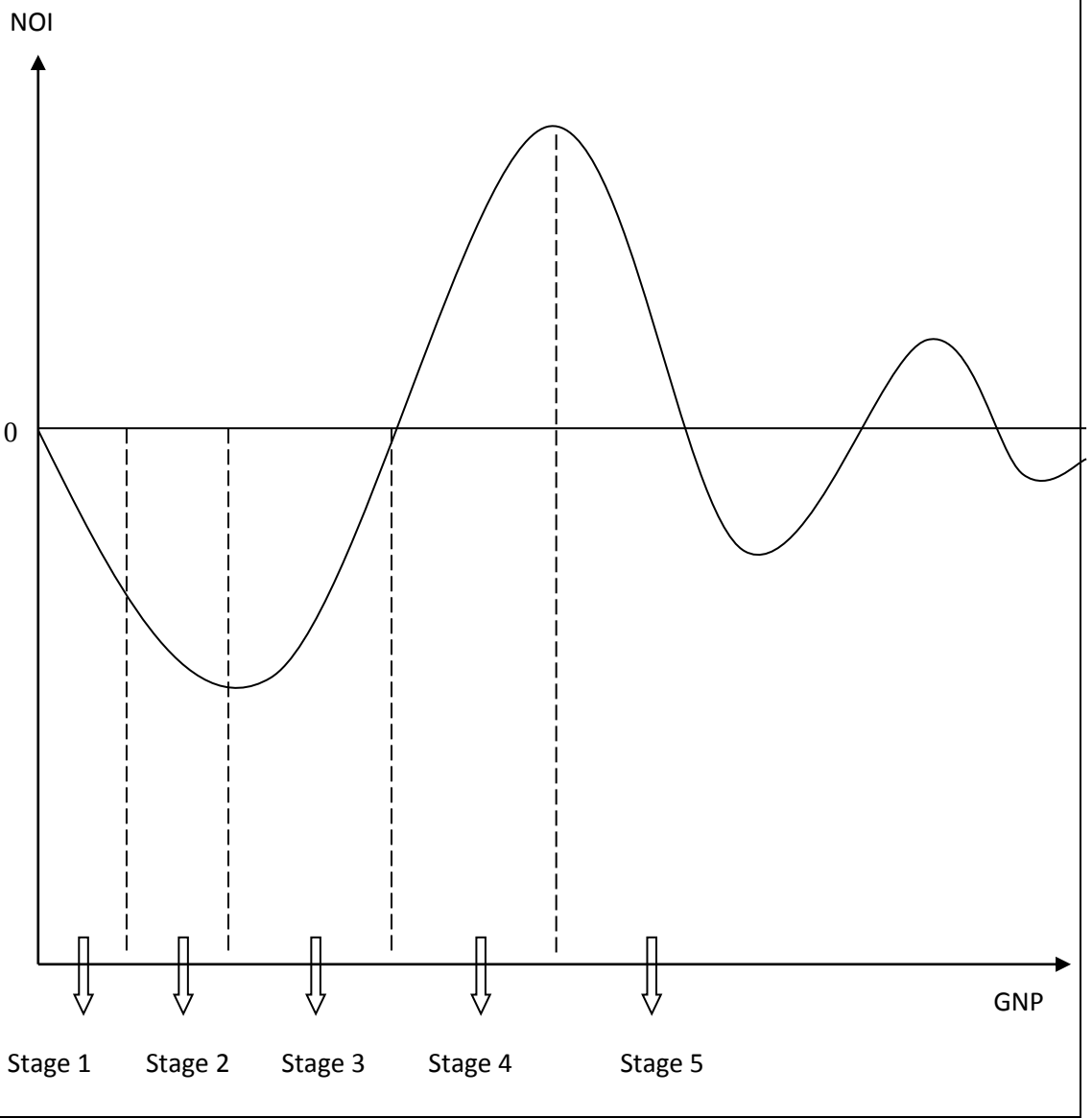
Dunning (1981) puts forward the investment development path, which suggests that inward and outward direct investment positions of a country are related to its economic development. The basic hypothesis is that as country develops, the OLI (Ownership, Location, Internalization) advantages facing its indigenous firms that might invest

abroad and foreign firms that might invest in the country change. As a consequence, the amounts of inward and outward FDI also change. The investment development path identifies that countries tend to go through five stages of development (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001). Figure 3.1 shows the pattern of the investment development path. The horizontal line represents GNP. The vertical line represents net outward investment (NOI) position, which is the gross outward direct investment stock outside a country's national boundaries minus the gross inward direct investment stock within its boundaries.

Stage 1

In stage 1, a country is under pre-industrialisation stage with low level of income, the only location advantage to attract foreign firms is the possession of natural resources. The lack of location advantages may be due to small domestic market, undeveloped economic systems, inappropriate government policies, inadequate infrastructure and the lack of educated workforce. Inward FDI is likely to occur in the primary good sector and labour-intensive manufacturing sectors to supply the local or export markets. In addition, the country has not generated sufficient ownership advantages to overcome the barriers of foreign production. Outward FDI is directed to agricultural and labour-intensive craft industries for trade-supporting or asset-seeking purposes. Hence, inward FDI is little, outward FDI is negligible and the net outward investment is negative. The appropriate government policies at this stage are to improve infrastructure and human capital (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

Figure 3.1 The pattern of the investment development path



Source: Dunning and Narula (1996)

Stage 2

A country's development in the second stage is driven by investment. The locational attractions increase probably because of increased expenditures on secondary education, public utilities, transport and communication, etc. Furthermore, the growth of market size in the host country encourages foreign firms to exploit economies of scale. One type of inward FDI takes the form of import substituting investment in labour-intensive manufacturing sectors, which is market-seeking and might be stimulated by import

barriers imposed by host government. Another type is export-oriented investment in natural resources and primary commodities sectors, which is attracted to seek natural resources, raw materials and cheap labour cost in the host country (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

The ownership advantages are developed due to the improvement of location advantages, the development of primary industries and its support industries. The purpose of outward FDI is to seek market in countries at lower stage and to acquire foreign technology in countries at higher stages. Outward FDI is shifted towards capital-intensive sectors and standardized consumer goods sectors. The amount of outward FDI emerges at this stage, but remains low. Inward FDI is increasing at a faster rate than outward FDI. As a consequence, the net outward investment is decreased. At this stage, the government plays an important role in developing ownership advantages by providing indigenous firms the impetus to develop and acquire advanced technology (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

Stage 3

As a country moves along the development path to the third stage, its economic growth is driven by innovation. Foreign firms are attracted to the country due to skilled labour, managerial skills and innovatory capacity instead of low labour cost and natural resources. Inward FDI shifts towards sophisticated goods production due to consumers' demand for high quality goods. In addition, some inward FDI occur in strategic asset acquiring production to seek technology. The improved location advantages, in addition to the presence of foreign firms and governments' policies, make indigenous firms upgrade their ownership advantages such as product innovation. Outward market-

seeking investment and export-oriented investment are directed to less developed countries in differentiated consumer goods sectors, whereas outward FDI is directed to more developed countries to seek markets and to acquire or upgrade technology (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

At this stage, the growth rate of outward FDI is increasing while the growth rate of inward FDI is decreasing. However, the amount of inward FDI still exceeds that of outward FDI resulting in negative and increasing net outward FDI. The government's role as developing ownership advantages is less significant. The government mainly seeks to attract inward FDI in those sectors where it has weak ownership advantages and strong location advantages. At the same time, it attempts to encourage outward FDI in those sectors where it has strong ownership advantages and weak location advantages (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

Stage 4

The location advantages at this stage are similar with those in stage 3. The ownership advantages are stronger due to the ability to organize geographically dispersed assets and process specialization. Firms have an increasing propensity to penetrate foreign markets in the form of FDI. Firms are induced to move operations to countries at lower stages to maintain their competitive advantages, to overcome trade barriers, to seek market and resources. Some outward FDI is also directed towards higher stage countries to overcome trade barriers and to acquire strategic assets (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

The income level and industrial structure of a developing country at this stage are approaching those of a developed country. Outward FDI is still rising at a faster rate than inward FDI. Furthermore, the propensity of indigenous firms to engage in outward FDI exceeds that of foreign firms to engage in inward FDI. As a consequence, outward FDI is greater than inward FDI and net outward investment is positive. The main roles of the government are to reduce transaction costs of economic activity and to maintain efficiency of markets and resource allocation by facilitating the economy rather than direct intervention (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

Stage 5

The final stage is the most advanced stage of economic development, which has been reached by some developed industrial countries. The attractions of a particular location depend on asset accumulation, support services and market facilitating services. Market-seeking and asset-seeking inward FDI come from countries at lower stages, while rationalized and asset-seeking inward FDI come from countries in stage 4 or stage 5. The ownership advantages are based on the ability to acquire assets, the ability to upgrade technology, the efficiency of economic and organizational systems, the ability to coordinate different ownership advantages and the ability to exploit the benefits of cross-border common governance. Resource-seeking outward FDI is directed to less developed countries, whereas asset-seeking outward FDI is directed to more developed countries. Both inward FDI and outward FDI are likely to occur mainly in information and high-value service sectors (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

Both inward FDI and outward FDI continue to rise. The net outward investment first falls and then fluctuates around the zero level. At the final stage, the income levels and economic structures of developed countries become more similar. In addition, the ownership advantages and location advantages are transferable across national boundaries. As a result, these factors may lead to increased convergence among countries. Therefore, the international direct investment positions are likely to become more balanced, which results in roughly equal amounts of inward and outward FDI for a particular country. The government still plays an active role in maintaining efficient market, reducing structural adjustment costs and other transaction costs. More importantly, the government tries to overcome market failure, which arises due to technological complexity and the interdependence of markets. Another role of the government is to ensure the quality of location advantages and to set the competitive environment for their own firms to upgrade ownership advantages (Dunning, 1993; Dunning and Narula, 1996; Dunning, 2001).

3.3.3.2 Other impacts of economic growth on inward/outward FDI

Economic growth can be seen as an indicator of future market potential in the host country, whereby higher rate of economic growth ensures long-term commitment by foreign investors as it leads to an increase in income and consumer demand for goods and services (Noorbakhsh *et al.*, 2001). It also implies better infrastructure, provides greater incentive for inward FDI (Tsai, 1994) and influences positively the business climate for inward FDI (Morisset, 2000). Moreover, rapid growth may also give rise to the presence of economic rents that will encourage inward FDI (Globerman and Shapiro, 1999).

Furthermore, economic growth in the home country are positively related with outward FDI. With higher economic performance and development, the banks in the home country are able to provide more loans for firms to invest abroad (Wang and Wong, 2007). Moreover, firms are more likely to develop their ownership advantages in terms of economies of scale in the production, improvement of marketing expertise, invention and adoption of new technology etc. These are competitive advantages for firms to undertake foreign production (Globerman and Shapiro, 1999; Kyrkilis and Pantelidis, 2003; Kueh *et al.*, 2009).

3.3.4 Empirical literature on the relationship between inward/outward FDI and economic growth

This section reviews the empirical studies that investigate the relationship between inward/outward FDI and host/home country's overall economic growth, which use aggregate inward/outward FDI from/to the rest of the world. Some studies only examine whether there is a one-way relationship from inward/outward FDI to economic growth or whether there is a one-way relationship from economic growth to inward/outward FDI, therefore ignoring the reverse relationship. However, the causality studies examine the two-way relationship between the two variables.

3.3.4.1 The relationship between inward FDI and economic growth

Empirical studies examine the impact of inward FDI on growth, the impact of growth on inward FDI and the two-way relationship illustrated in Table 3.34 – Table 3.36. In Table 3.34, most studies relate to developing or a mix of developing and developed countries experiences and find a positive impact of FDI on growth. However, the positive impact of FDI is conditional on the host country's threshold absorptive capacity, such as human capital, trade openness, income level, financial development, institutional development etc. Thus, only countries that are above threshold level of

development benefit from inward FDI. Alternatively, countries that are above threshold level of development benefit more from inward FDI than countries that are below threshold level of development. There are only three studies (Blonigen and Wang, 2005; Kottaridi, 2005; Ghosh and Wang, 2009) focusing explicitly on developed countries. Blonigen and Wang (2005) do not find a significant impact of inward FDI on economic growth in the developed countries. According to Kottaridi (2005), inward FDI plays a positive role in booting economic growth in the core countries (Belgium-Luxembourg, France, Germany, Netherlands and UK) and the beneficial effect of FDI is enhanced for countries with good human capital. However, inward FDI is incapable of increasing economic growth in the peripheral countries (Greece, Ireland, Italy, Portugal and Spain). In addition, Ghosh and Wang (2009) find the evidence of a positive effect of inward FDI on economic growth in 24 developed countries and the positive effect does not depend on the R&D expenditure in the host country.

Empirical studies also investigate the reverse impact of economic growth on inward FDI in the host country (see Table 3.35). However, the majority of studies focus on developing countries or a mix of developed and developing countries, there are only three studies on developed countries. Two studies find a positive impact of economic growth on inward FDI, while one study does not find a significant impact.

Many studies examine the two-way relationship between inward FDI and economic growth with the majority of empirical studies apply causality testing and find FDI-led growth, growth-led FDI, bi-directional causality and no causality between the two variables (see Table 3.36). However, most causality test studies concentrate on developing countries, only five studies (Ericsson and Irandoust, 2001; Ekanayake *et al.*,

2003; Asheghian, 2004; Qi, 2007; Iyer *et al.*, 2009) focus explicitly or partly on developed countries. Studies on developed countries find different results based on country sample, time period and methodology. However, these studies do not look for a pattern in the results.

This study tries to fill in the literature gap by examining the causal relationship between inward FDI and economic growth in developed OECD countries in Chapter 4. In addition, it tries to look for a pattern in the results to explain why different developed countries experience different FDI-growth relationships.

Table 3.34 Empirical studies that examine the impact of inward FDI on economic growth in the host country			
Studies on developed host countries			
Authors	Host country	Empirical results	Other findings
Blonigen and Wang (2005)	A sample of developed and developing countries	Insignificant in developed countries	
Kottaridi (2005)	10 developed countries	Positive in the core countries and stronger effect for countries with good human capital. Insignificant in the peripheral countries	The effect of FDI on growth depends on the level of human capital in the core countries. The effect of FDI on growth does not depend on the level of human capital in the peripheral countries.
Ghosh and Wang (2009)	24 developed countries	Positive	The effect of FDI on growth does not depend on the level of expenditure in R&D in the host country.
Studies on developing host countries or a mix of developed and developing host countries			
Authors	Host country	Empirical results	Other findings
Papanek (1973)	85 developing countries	<u>All countries</u> Positive <u>Asian and Mediterranean countries</u> Positive <u>Sub-Saharan African and Latin American countries</u> Insignificant	
Kaufman *et al.* (1975)	17 developing countries	Positive	
Stoneman (1975)	70 developing countries	Negative	

Bornschier *et al.* (1978)	76 developing countries	FDI flow has an insignificant effect FDI stock has a negative effect, stronger negative effect for richer countries	
McGowan and Smith (1978)	30 developing countries	Positive	
Gobalet and Diamond (1979)	56 developed and developing countries	Negative in the whole sample Stronger negative effect for poor countries Stronger negative effect for poor countries with small domestic market size	
Jackman (1982)	72 developing countries	Positive in the whole sample and for wealthy countries Insignificant for poor countries	
Rothgeb (1984a)	68 developing countries	FDI flow has a positive effect in the short run and FDI stock has a negative effect in the long run	
Rothgeb (1984b)	18 developing countries	FDI flow has an immediate negative effect, followed by a positive effect after 5 years. FDI stock has a negative effect in the long run	
Yang and Stone (1985)	86 developing countries	Positive in semi-peripheral countries Negative in peripheral countries	
Sharma (1986)	62 developing countries	Positive	
De Gregorio (1992)	12 developing countries	Positive	
Fry (1993)	16 developing countries	Positive for countries with low levels of distortion and negative for countries with high levels of distortion	The effect of FDI on growth depends on the level of financial repression and trade distortions in the host country.
Blomstrom *et al.* (1994)	101 developed and developing countries	Positive in the whole sample and the developing countries sample Positive in higher-income developing countries, insignificant in lower-income	The effect of FDI on growth depends on the level of income in the host country.

		developing countries.	
Tsai (1994)	62 developing countries	Insignificant	
Balasubramanyam *et al.* (1996)	46 developing countries	Positive in the whole sample and export promoting countries, insignificant in import substituting countries	The effect of FDI on growth depends on trade policy regime in the host country.
Dutt (1997)	58 developing countries	Negative	
Bende-Nabende and Ford (1998)	1 developing country	Positive	
Borensztein *et al.* (1998)	69 developing countries	Positive for countries with high level of human capital and negative for countries with low level of human capital	The effect of FDI on growth depends on the level of human capital in the host country.
Nyatepe-Coo (1998)	12 developing countries	Positive for countries with developed financial systems and high degree of openness	The effect of FDI on growth depends on the level of financial development and the degree of openness in the host country. The effect of FDI on growth does not depend on the level of human capital in the host country.
Olofsdotter (1998)	50 developed and developing countries	Stronger positive effect for countries with higher level of institutional development	The effect of FDI on growth depends on the level of institutional development in the host country. The effect does not depend on the degree of openness and the level of human capital in the host country.
Balasubramanyam *et al.* (1999)	46 developing countries	Positive for countries with higher joint level of labour force and human capital	The effect of FDI on growth depends on the joint level of labour force and human capital in the host country.
de Mello (1999)	32 developed and developing countries	Stronger positive effect for technological advanced countries, where the degree of substitutability between FDI and domestic	The effect of FDI on growth depends on the degree of complementarity and substitution between FDI and domestic

		investment is high	investment in the host country.
Bende-Nabende *et al.* (2001)	5 developing countries	Positive for Indonesia, Malaysia and Philippines, negative for Singapore, insignificant for Thailand	
Nair-Reichert and Weinhold (2001)	24 developing countries	Stronger positive effect for open economies	The effect of FDI on growth depends on the degree of openness in the host country.
Sadik and Bolbol (2001)	5 developing countries	Insignificant for Jordan, Morocco and Oman, negative for Egypt, Saudi Arabia and Tunisia	
Jalilian and Weiss (2002)	42 developed and developing countries	Stronger positive effect for countries with higher human capital and lower income	The effect of FDI on growth depends on the level of human capital and income in the host country.
Oliva and Rivera-Batiz (2002)	119 developing countries	Positive	
Ram and Zhang (2002)	85 developed and developing countries	Positive	The effect of FDI on growth does not depend on the level of human capital in the host country.
Bengoa and Sanchez-Robles (2003)	18 developing countries	Positive	
Hermes and Lensink (2003)	67 developing countries	Positive for countries with good financial development and negative for countries with weak financial development	The effect of FDI on growth depends on the level of financial development in the host country.
Kohpaiboon (2003)	1 developing country	Positive under export promotion trade regime and negative under import substitution trade regime	The effect of FDI on growth depends on trade regimes.
Trevino and Upadhyaya (2003)	5 developing countries	Positive	
Akinlo (2004)	1 developing country	Insignificant	

Alfaro *et al.* (2004)	71 developed and developing countries	Positive for countries with developed financial market	The effect of FDI on growth depends on the level of financial development in the host country.
Atique *et al.* (2004)	1 developing country	Stronger positive effect under export promotion trade regime	The effect of FDI on growth depends on trade regimes.
Durham (2004)	83 developed and developing countries	Positive for countries with good financial and institutional development.	The effect of FDI on growth depends on the level of financial and institutional development in the host country. The effect does not depend on the level of human capital, trade and corruption in the host country.
Lyroudi *et al.* (2004)	17 developing countries.	Insignificant	The effect of FDI on growth does not depend on the level of income and growth rate in the host country.
Makki and Somwaru (2004)	66 developing countries	Positive for countries with high levels of trade	The effect of FDI on growth depends on the level of trade in the host country. The effect does not depend on the level of human capital and domestic investment in the host country.
Blonigen and Wang (2005)	A sample of developed and developing countries	Insignificant for the whole sample Positive for developing countries with high levels of human capital	The effect of FDI on growth in developing countries depends on the level of human capital in the host country.
Carkovic and Levine (2005)	72 developed and developing countries	Insignificant	The effect of FDI on growth does not depend on the stock of human capital, the level of income per capita, the level of financial development and the degree of trade openness in the host country.
Khawar (2005)	59 developing countries	Positive	
Le and Suruga	105 developed and	Stronger positive effect for countries with	The effect of FDI on growth depends on

(2005)	developing countries	lower public investment	the level of public investment in the host country.
Lumbila (2005)	47 developing countries	Positive for countries with low inflation and low risk, insignificant for countries with high inflation and high risk Stronger positive effect for countries with higher level of human capital and infrastructure development	The effect of FDI on growth depends on the level of inflation, human capital, infrastructure development and country risk.
Sylwester (2005)	29 developing countries	Positive	
Busse and Groizard (2006)	89 developed and developing countries	Positive for less regulated countries and negative for most regulated countries	The effect of FDI on growth depends on government regulations in the host country.
Fedderke and Romm (2006)	1 developing country	Positive	
Basu and Guariglia (2007)	119 developing countries	Positive	
Greenaway *et al.* (2007)	77 developing countries	Insignificant in the whole sample Positive for open economies and negative for closed economies.	The effect of FDI on growth depends on trade regime in the host country.
Yang (2008)	110 developed and developing countries	<u>1973-1987 period</u> Positive in Latin America and the Caribbean, negative in the North Africa and Middle East, insignificant in South Asia, East Asia and Pacific <u>1988-2002 period</u> Positive in OECD, Europe and Central Asia, negative in Sub-Saharan Africa, insignificant in South Asia, East Asia and Pacific	

Batten and Vo (2009)	79 developed and developing countries	Stronger positive effect for countries with higher level of human capital, higher level openness to trade, better stock market development and lower inflation rate	The effect of FDI on growth depends on the level of human capital, openness to trade, stock market development and inflation rate in the host country.

Source: Author's own work.

Table 3.35 Empirical studies that examine the impact of economic growth on inward FDI in the host country

Studies on developed host countries		
Authors	Host country	Empirical Results
Billington (1999)	7 developed countries	Positive
Lipsey (2000)	22 developed countries	Positive
Radulescu and Robson (2008)	19 developed countries	Insignificant
Studies on developing host countries or a mix of developed and developing host countries		
Authors	Host country	Empirical Results
Schneider and Frey (1985)	54 developing countries	Positive
Torrisi (1985)	1 developing country	Insignificant
Tsai (1994)	62 developing countries	Insignificant (1975-1978) Positive (1983-1986)
Singh and Jun (1995)	31 developed and developing countries	Insignificant
Wang and Swain (1995)	2 developing countries	Insignificant
Dunning and Narula (1996)	88 developed and developing countries	Positive
Gastanaga *et al.* (1998)	49 developing countries	Positive
Bende-Nabende *et al*. (2001)	5 developing countries	Positive (Malaysia and Thailand) Negative (Indonesia, Philippines and Singapore)
Noorbakhsh *et al.* (2001)	36 developing countries	Positive
Obwona (2001)	1 developing country	Positive
Asiedu (2002)	71 developing countries	Insignificant

Hsiao and Shen (2003)	23 developing countries	Positive
Greenaway *et al*. (2007)	54 developing countries	Insignificant
Naude and Krugell (2007)	43 developing countries	Positive
Ang (2008)	1 developing country	Positive
Moosa (2009)	18 developing countries	Positive
Source: Author's own work.		

Table 3.36 Empirical studies that examine the two-way relationship between inward FDI and economic growth in the host country			
Studies on developed host countries			
Authors	Host country	Empirical results	Other findings
Ericsson and Irandoust (2001)	4 developed countries	FDI-led growth in Norway Bi-directional causality in Sweden No causality in Denmark and Finland	
Bende-Nabende *et al.* (2003)	1 developed country	No relationship in Japan	
Ekanayake *et al.* (2003)	2 developed countries	FDI-led growth in US No causality in Canada	
Asheghian (2004)	1 developed country	FDI-led growth in United States	
Roy and Van den Berg (2006)	1 developed country	Positive effect of FDI on growth and negative effect of growth on FDI in United States	
Qi (2007)	13 developed countries	<u>Short-run</u> Growth-led FDI in 2 countries No causality in 11 countries <u>Long-run</u> Bi-directional causality in 1 country No causality in 10 countries More growth → less FDI in 2 countries	

Iyer *et al.* (2009)	1 developed country	Short-run FDI-led growth in Australia Long-run FDI-led growth in Australia	
Studies on developing host countries or a mix of developed and developing host countries			
Authors	Host country	Empirical results	Other findings
Kraska and Taira (1974)	13 developing countries	Positive effect of FDI on growth and positive effect of growth on FDI	
Khan and Leng (1997)	3 developing countries	Growth-led FDI in Singapore No causality in Korea and Taiwan	
Gyapong and Karikari (1999)	2 developing countries	FDI-led growth in Ghana Growth-led FDI in Ivory Coast	
Obwona (2001)	1 developing country	Insignificant effect of FDI on growth positive effect of growth on FDI	
Zhang (2001)	11 developing countries	Short-run causality for 6 countries FDI-led growth in Singapore Growth-led FDI in Brazil, Korea, Malaysia and Thailand No causality in Argentina Long-run causality for 5 countries FDI-led growth in Hong Kong and Taiwan Growth-led FDI in Colombia Bi-directional causality in Indonesia and Mexico	
Alguacil *et al.* (2002)	1 developing country	FDI-led growth in Mexico	
Chakraborty and Basu (2002)	1 developing country	Growth-led FDI in India	
Campos and Kinoshita	25 developing countries	Positive effect of FDI on growth	The effect of FDI on growth

(2002)			does not depend on the level of human capital in the host country.
Liu *et al.* (2002)	1 developing country	Bi-directional causality in China	
Shan (2002)	1 developing country	Two-way positive relationship in China	The effect of growth on FDI is more significant than the effect of FDI on growth
Basu *et al.* (2003)	23 developing countries	Short run Bi-directional causality for all countries Bi-directional causality for more closed economies Bi-directional causality for more open economies Long run Bi-directional causality for all countries Growth-led FDI for more closed economies Bi-directional causality for more open economies	FDI-growth linkage depends on the level of trade openness in the host country.
Bende-Nabende *et al.* (2003)	4 developing countries	No relationship in Hong Kong Positive effect of FDI on growth and negative effect of growth on FDI in Philippines Negative effect of FDI on growth and positive effect of growth on FDI in Taiwan Positive effect of FDI on growth and negative effect of growth on FDI in Thailand	
Choe (2003)	80 developed and developing countries	Bi-directional causality	Growth-led FDI is more apparent than FDI-led growth.
Ekanayake *et al.* (2003)	3 developing countries	FDI-led growth in Mexico Growth-led FDI in Chile Bi-directional causality in Brazil	

Hsiao and Shen (2003)	1 developing country	Two-way positive relationship in China	
Kim and Seo (2003)	1 developing country	Insignificant effect of FDI on growth and positive effect of growth on FDI in Korea	
Mencinger (2003)	8 developing countries	More FDI leads to less growth	
Cuadros *et al.* (2004)	3 developing countries	FDI-led growth in Argentina and Mexico No causality in Brazil	
Li and Liu (2005)	84 developed and developing countries	<u>Developed countries sample</u> Positive two-way relationship Stronger positive effect of FDI on growth for countries with good human capital <u>Developing countries sample</u> Positive two-way relationship Stronger positive effect of FDI on growth for countries with good human capital and negative effect of FDI on growth for countries with wide technology gap compared with the United States	The effect of FDI on growth depends on the level of human capital in the developed countries. The effect of FDI on growth depends on the level of human capital and technology-absorptive ability in the developing countries.
Baharumshah and Thanoon (2006)	8 developing countries	Bi-directional causality	
Chowdhury and Mavrotas (2006)	3 developing countries	Growth-led FDI in Chile Bi-directional causality in Malaysia and Thailand	
Hansen and Rand (2006)	31 developing countries	FDI-led growth	The effect of FDI on growth does not depend on the level of GDP per capita, human capital, trade openness and financial development.
Hsiao and Hsiao (2006)	8 developing countries	<u>Time-series data</u> FDI-led growth in Singapore Growth-led FDI in China	<u>Panel data</u> FDI also causes growth indirectly through exports

		Bi-directional causality in Thailand No causality in Hong Kong, Korea, Malaysia, Philippines and Taiwan <u>Panel data</u> FDI-led growth	
Chang (2007)	1 developing country	No causality in Taiwan	
Qi (2007)	34 developing countries	<u>Short-run</u> FDI-led growth in 5 countries Growth-led FDI in 7 countries Bidirectional causality in 1 country No causality in 16 countries More FDI → less growth in 2 countries More FDI → more growth → less FDI in 1 country More FDI → less growth → more FDI in 1 country More FDI → less growth → less FDI in 1 country <u>Long-run</u> FDI-led growth in 3 countries Growth-led FDI in 12 countries Bi-directional causality in 8 countries No causality in 5 countries More FDI → less growth in 2 countries More growth → less FDI in 2 countries More FDI → less growth → more FDI in 2 countries	
Duttaray *et al.* (2008)	66 developing countries	FDI affects growth in 29 countries, of which FDI directly causes growth in 21 countries Growth affects FDI in 20 countries, of which growth	FDI also affects growth through exports and /or productivity. Growth also affects FDI

		directly causes FDI in 18 countries	through exports and productivity.
Herzer *et al.* (2008)	28 developing countries	Short-run FDI-led growth in 4 countries Growth-led FDI in 3 countries Bi-directional causality in 1 country No causality in 16 countries More FDI → less growth in 4 countries Long-run No causality in 21 countries More FDI → less growth in 1 country More growth → less FDI in 2 countries More FDI → less growth → less FDI in 4 countries	FDI-growth linkage does not depend on the level of per capita income, education level, the degree of openness and the level of financial market development.
Ang (2009)	1 developing country	Short-run No causality in Malaysia Long-run Growth-led FDI in Malaysia	FDI contributes to growth through financial development. The positive effect of FDI on growth depends on the level of financial development in the host country.
Lee (2009)	1 developing country	Short-run FDI-led growth in Malaysia Long-run Growth-led FDI in Malaysia	
Liu *et al.* (2009)	9 developing countries	FDI, imports and exports together enhance economic growth in Hong Kong, India, Indonesia, Korea, Malaysia,	

		Philippines, Singapore, Thailand and Taiwan Economic growth, imports and exports together attract FDI in Hong Kong, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand and Taiwan	
Source: Author's own work.			

3.3.4.2 The relationship between outward FDI and economic growth

Empirical studies on the relationship between outward FDI and home country's economic growth are limited (see Table 3.37). Looking at the studies on developed countries, Ghosh and Wang (2009) find that outward FDI plays a positive role in the home country's economic growth in 24 developed countries. In addition, Lipsey (2000) examines the determinants of outward FDI and finds that economic growth is a factor positively affecting outward FDI in 22 developed home countries. Finally, Herzer (2008) tests the two-way relationship and finds bi-directional causality between outward FDI and economic growth for 14 developed home countries.

Hence, this study will contribute to the current studies by investigating the causal relationship between outward FDI and economic growth in developed OECD countries in Chapter 4. Moreover, it will try to look at whether FDI-growth relationship depends on country-specific factors such as income level, trade openness, financial development and so on.

Table 3.37 Empirical studies that examine the relationship between outward FDI and economic growth in the home country

The impact of outward FDI on economic growth		
Studies on developed home countries		
Authors	Home country	Empirical results
Ghosh and Wang (2009)	24 developed countries	Positive
The impact of economic growth on outward FDI		
Studies on developed home countries		
Authors	Home country	Empirical results
Lipsey (2000)	22 developed countries	Positive
Studies on developing home countries or a mix of developed and developing home countries		
Authors	Home country	Empirical results
Dunning and Narula (1996)	54 developed and developing countries	Positive
Williams (2009)	15 developing countries	Positive
The two-way relationship between outward FDI and economic growth		
Studies on developed home countries		

Authors	Home country	Empirical results
Herzer (2008)	14 developed countries	Bi-directional causality
Studies on developing home countries		
Authors	Home country	Empirical results
Chang (2007)	1 developing country	No causality
Source: Author's own work.		

3.4 Research methodology

This section presents research approach and data collection method used in this study. Research approaches can be classified as quantitative and qualitative research. Quantitative research involves collection of numerical data and emphasizes a deductive approach to test theories, while qualitative research is more concerned with words rather than numbers and emphasizes an inductive approach to generate theories (Bryman and Bell, 2007). This study adopts a quantitative approach as quantitative research is associated with testing hypotheses and theories, which is suitable for the deductive approach of this research. Moreover, quantitative research is employed as a result of the review of previous empirical FDI related studies in Sections 3.2 and 3.3. There are a variety of data collection techniques which can be utilised in quantitative studies, including secondary data, questionnaire, interview and observation (Saunders *et al.*, 2009).

Secondary data are used in this research as they offer numerous advantages to researchers. First, some secondary data are available without cost in public libraries or on the internet, so researchers save time and money to use them (Bryman and Bell, 2007; Henn *et al.*, 2009; Saunders *et al.*, 2009). Second, secondary data such as government official statistics allow researchers to examine high quality data as they are collected by technical experts (Bryman and Bell, 2007; Henn *et al.*, 2009; Saunders *et al.*, 2009). In addition, the availability of data over time and across different regions offer the

opportunity for cross-regional and longitudinal analysis (Frankfort-Nachmias, 1994; Bryman and Bell, 2007; Henn *et al.*, 2009; Saunders *et al.*, 2009).

However, there are some limitations of secondary data. First, some variables of your interest may not be available (Frankfort-Nachmias, 1994; Bryman and Bell, 2007). Second, access to certain data sources may be difficult or costly (Saunders *et al.*, 2009). Moreover, the definition and collection methods used in certain data sources might be unsuitable for your research questions (Saunders *et al.*, 2009). Furthermore, variables from different data sources may be collected using different definitions and methods, so it might be difficult to compare and combine different data sources (Henn *et al.*, 2009; Saunders *et al.*, 2009). In addition, there might be some problems of potential bias and calculation errors (Frankfort-Nachmias, 1994). Finally, secondary data on recent years might not be available due to the time-lag between collection and publication of results (Henn *et al.*, 2009).

Despite these limitations, secondary data are suitable for this research rather than questionnaires, interviews and observations for several reasons. First, the empirical analysis of this thesis rests upon country-level macroeconomic variables, such that official statistics are the only sources available for these variables, as only the governments and international organizations (e.g. the OECD, IMF and World Bank) have the capacity to collect data on a global scale. Second, previous literature in Sections 3.2 and 3.3 entirely employs official statistics in their examination of FDI-related issues. In addition, there are no ethical issues involved when using secondary data from official sources. Therefore, secondary data are appropriate for this research.

3.5 Conclusion

This thesis investigates three research questions relating to the determinants of inward and outward FDI and their relationship with economic growth for a group of developed OECD countries. Current empirical studies on the determinants of inward FDI concentrate on developing countries. In terms of the developed countries, empirical studies employ firm level data, industry level data, bilateral FDI data, with limited studies on aggregate inward FDI data from the rest of the world including Bajo-rubio and Sosvilla-Rivero (1994), Billington (1999), Globerman and Shapiro (1999), Lipsey (2000), Yang *et al.* (2000), Kottaridi (2005), Wijeweera and Clark (2006), Radulescu and Robson (2008). The literature review also shows that market size, economic growth, agglomeration effect, trade openness, exchange rate, inflation rate, corporate tax, labour cost, trade union density, employment protection legislation, wage bargaining coordination, R&D expenditure and human capital play important roles in affecting inward FDI into developed countries. However, studies on labour market flexibility using aggregate FDI data are limited with only one study by Radulescu and Robson (2008). Finally, current studies on developed countries include economic growth as an important determinant of inward FDI, but do not take into account the reverse relationship from inward FDI to economic growth.

Turning to the determinants of outward FDI, there are only five studies on developed countries using aggregate outward FDI data to the rest of the world (Shapiro, 1980; Globerman and Shapiro, 1999; Lipsey, 2000; Kyrkilis and Pantelidis, 2003; Wang and Wong, 2007). Moreover, Globerman and Shapiro (1999, 2002) believe that inward FDI and outward FDI are symmetrical, so outward FDI is influenced by the same factors that affect inward FDI. Therefore, the same factors that influence inward FDI (market size,

economic growth, agglomeration effect, trade openness, exchange rate, inflation rate, corporate tax, labour cost, trade union density, employment protection legislation, wage bargaining coordination, R&D expenditure and human capital) are also important determinants of outward FDI. In addition, there are no studies on the effect of labour market flexibility on outward FDI. Finally, current studies on developed countries include economic growth as an explanatory variable in outward FDI equation, but ignore the feedback relationship from outward FDI to economic growth.

For the last research question, most studies analyse the one-way relationship from inward FDI to economic growth or the two-way relationship focusing on developing countries or a mix of developed and developing countries. However, studies on developed countries that test the two-way relationship between inward FDI and economic growth are limited and find mixed results depending on the country sample, time period and methodology. In addition, these studies do not explain why different countries experience different FDI-growth relationships. Moreover, there is a dearth of empirical literature on the two-way link between outward FDI and home country's economic growth.

Therefore, this research contributes to the existing literature by focusing on developed OECD countries and aggregate inward/outward FDI data from/to the rest of the world. Moreover, it examines the determinants of inward/outward FDI with economic growth as an explanatory variable and takes into account of the feedback relationship from inward/outward FDI to economic growth. In addition, this study analyses whether labour market flexibility has a significant impact on inward/outward FDI. Finally, it investigates the two-way relationship between inward/outward FDI and economic

growth and looks at whether country-specific factors can explain the different FDI-growth relationships in different countries.

4 The causal relationship between inward/outward FDI and economic growth

4.1 Introduction

The role of inward FDI on economic growth has attracted the attention of researchers for many years as the beneficial impact of inward FDI has been recognised theoretically by scholars and policy makers. However, the empirical evidence in the literature remains ambiguous (Yang, 2008). In fact, there is conflicting evidence in the literature regarding the effect of inward FDI on economic growth (Nair-Reichert and Weinhold, 2001).

The objective of this chapter is to investigate the causal relationship between FDI inflows/outflows and economic growth in developed OECD countries. Investigation of the causal link between FDI inflows and growth has important implications for policymakers. If there is a unidirectional causality from FDI inflows to economic growth, it would support the FDI-led growth hypothesis that FDI inflows promote economic growth in the host country. If the causal link runs in the opposite direction, it would imply that economic growth may be a prerequisite for countries to attract FDI. If the causal process is bi-directional, FDI inflows and growth would have a reinforcing causal relationship (Zhang, 2001).

This chapter contributes to the existing literature by focusing on developed countries as inward/outward FDI has become an increasingly significant factor in influencing the economic activity in a developed country. Moreover, most previous time-series causality studies focus on developing countries and only a few studies cover developed countries (Ericsson and Irandoust, 2001; Ekanayake *et al.*, 2003; Asheghian, 2004; Qi,

2007; Iyer *et al.*, 2009). However, almost all of the world's FDI originates from developed countries and the majority of FDI is also located in developed countries. Another feature is that this chapter also tests the causal link between outward FDI and economic growth. Outward FDI might promote the home country's economic growth as it might yield higher profits, transfer technology and management skills to the home country, expand production abroad, secure raw materials overseas, avoid trade barriers and so on.

This chapter is organised as follows. Section 4.2 describes empirical causality testing methodology. Sections 4.3 and 4.4 present model specification and data. The next Section discusses empirical results. Finally, it ends with conclusion.

4.2 Methodology

4.2.1 Conventional causality test

The idea of causality testing was developed by Granger (1969) between two variables X_t and Y_t based on the model of one variable X_t (Y_t) on the lagged values of both variables.

$$X_t = \mu_1 + \sum_{i=1}^{k} \alpha_{1i} X_{t-i} + \sum_{i=1}^{k} \beta_{1i} Y_{t-i} + \varepsilon_{1t} \qquad (4.1)$$

$$Y_t = \mu_2 + \sum_{i=1}^{k} \alpha_{2i} X_{t-i} + \sum_{i=1}^{k} \beta_{2i} Y_{t-i} + \varepsilon_{2t} \qquad (4.2)$$

The unidirectional causality from X to Y is to test that the lagged X variables in equation (4.2) are jointly different from zero ($\sum_{i=1}^{k} \alpha_{2i} \neq 0$) and the lagged Y variables in equation (4.1) are jointly zero ($\sum_{i=1}^{k} \beta_{1i} = 0$). The unidirectional causality test from Y to X is to test that the lagged Y variables in equation (4.1) are jointly different from zero ($\sum_{i=1}^{k} \beta_{1i} \neq 0$)

and the lagged *X* variables in equation (4.2) are jointly zero ($\sum_{i=1}^{k} \alpha_{2i} = 0$). If both the lagged *Y* variables in equation (4.1) and the lagged *X* variables in equation (4.2) are jointly different from zero ($\sum_{i=1}^{k} \alpha_{2i} \neq 0$ and $\sum_{i=1}^{k} \beta_{1i} \neq 0$), there is a feedback relationship between the two variables. Finally, if both the lagged *Y* variables in equation (4.1) and the lagged *X* variables in equation (4.2) are jointly zero ($\sum_{i=1}^{k} \alpha_{2i} = 0$ and $\sum_{i=1}^{k} \beta_{1i} = 0$), there is no causal relationship between the two variables.

4.2.2 Causality test developed by Toda and Yamamoto (1995)

The Granger (1969) conventional causality test is valid for a VAR model with stationary or trend stationary variables as the Wald tests for causality follow standard chi-squared distribution asymptotically (Toda and Yamamoto, 1995). However, if the variables in the VAR model are integrated or cointegrated, the Wald tests have nonstandard asymptotic properties and the conventional causality test is not applicable (Dolado and Lutkepohl, 1996). For instance, if variables are known to be integrated of order one with no cointegration, VAR in first-order differences of the variables should be estimated (Dolado and Lutkepohl, 1996). Moreover, if the variables are known to be integrated of order one and to be cointegrated of order one, then error correction model (ECM) should be specified (Toda and Yamamoto, 1995).

Therefore, tests for unit roots and cointegration rank are usually required before estimating the VAR model. However, this can prove problematic because the unit root tests to test the null hypothesis of stationarity have low power against the alternative hypothesis of (trend) stationarity (Toda and Yamamoto, 1995). Moreover, simulation experiments show that Johansen's tests for cointegrating ranks are not very reliable for

sample sizes that are typical for economic time series (Toda and Yamamoto, 1995). Hence, size distortion and pre-test bias may cause serious problems (Yamada and Toda, 1998).

In order to overcome the above problems, Toda and Yamamoto (1995) propose a method that is applicable whether the VAR variables are stationary, integrated or cointegrated and ensures that the Wald tests have standard asymptotic distributions. Following Toda and Yamamoto (1995), we set up the following VAR model with two variables.

$$X_t = \mu_1 + \sum_{i=1}^{k+d} \alpha_{1i} X_{t-i} + \sum_{i=1}^{k+d} \beta_{1i} Y_{t-i} + \varepsilon_{1t} \qquad (4.3)$$

$$Y_t = \mu_2 + \sum_{i=1}^{k+d} \alpha_{2i} X_{t-i} + \sum_{i=1}^{k+d} \beta_{2i} Y_{t-i} + \varepsilon_{2t} \qquad (4.4)$$

where k is the optimal lag order, d is the maximal order of integration of the variables, ε_1, ε_2 and ε_3 are white noise error terms.

The optimal lag length (k) is determined and the VAR(p) model (p=k+d) is estimated with additional d-max lags as long as d does not exceed k. The conventional Wald test is then applied on the first k coefficient matrices using the standard χ^2 statistics. The coefficient matrices of the last $d_{\max}$ lagged vectors in the model are ignored since they are assumed as zeros (Toda and Yamamoto, 1995). The causal relationships between the variables are determined by the joint significance of the lagged variables. For example, only Y_t Granger causes X_t if the joint test of β_{1i} are statistically different from zero and the joint test of α_{2i} are zero ($i \leq k$). Only X_t Granger causes Y_t if the joint test of α_{2i} are statistically different from zero and the joint test of β_{1i} are zero ($i \leq k$). If both α_{2i} and

β_{1i} ($i \leq k$) are statistically different from zero, a two-way causal link exists. If both α_{2i} and β_{1i} ($i \leq k$) are zero, there is no causal link between the two variables.

The advantage of this methodology is that tests for unit roots and cointegration rank are not required, as they have proved to be problematic. Hence, this methodology is applicable whether the variables are stationary, integrated or cointegrated. There are some limitations on this approach. The Monte Carlo simulations suggest that this approach has advantages in terms of size stability, but might be inefficient in terms of low estimation power (Yamada and Toda, 1998). Toda and Yamamoto (1995) argue that the inefficiency depends on the specific model such that this might be big if a VAR system has many variables and the lag length is one (Toda and Yamamoto, 1995). On the other hand, the inefficiency might be relatively small if a VAR system has a small number of variables and long lag length (Toda and Yamamoto, 1995). In our model, we have a VAR system with three variables and long lag length. Therefore, the methodology is appropriate for our model as the inefficiency is relatively small.

4.3 Model specification

We incorporate inward FDI, outward FDI and economic growth into the VAR model, the equations to be estimated for each country are as follows:

$$X_t = \mu_1 + \sum_{i=1}^{k+d} \alpha_{1i} X_{t-i} + \sum_{i=1}^{k+d} \beta_{1i} Y_{t-i} + \sum_{i=1}^{k+d} \theta_{1i} Z_{t-i} + \varepsilon_{1t} \qquad (4.5)$$

$$Y_t = \mu_2 + \sum_{i=1}^{k+d} \alpha_{2i} X_{t-i} + \sum_{i=1}^{k+d} \beta_{2i} Y_{t-i} + \sum_{i=1}^{k+d} \theta_{2i} Z_{t-i} + \varepsilon_{2t} \qquad (4.6)$$

$$Z_t = \mu_3 + \sum_{i=1}^{k+d} \alpha_{3i} X_{t-i} + \sum_{i=1}^{k+d} \beta_{3i} Y_{t-i} + \sum_{i=1}^{k+d} \theta_{3i} Z_{t-i} + \varepsilon_{3t} \qquad (4.7)$$

t is the number of years

k is the optimal lag order

d is the maximal order of integration of the three variables

ε is white noise error terms.

X is inward FDI

Y is growth rate of real GDP

Z is outward FDI

4.4 Data

Annual FDI flow data are used as most previous time-series causality studies use flow data. The variables are FDI inflows as a percentage of GDP, FDI outflows as a percentage of GDP and the growth rate of GDP in constant 2000 US dollars. Real FDI values are not used since the investment deflator is not available, instead we use FDI inflows/outflows as a percentage of GDP and GDP in constant 2000 US dollars from World Development Indicators (2011). The time period is between 1981 and 2008. The reason for the starting year 1981 is that the data for determinants of inward/outward FDI in Chapter 5 are only available from 1981. The country sample includes 20 developed OECD countries – Australia, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK and US, although we include Switzerland where data are only available between 1983 and 2008. Other countries are not included as there are not enough observations: Belgium (2002-2008), Greece (1999-2008), Iceland (1986-2008), Luxembourg (2002-2008).

4.5 Data analysis

4.5.1 Unit root tests

The most commonly used test of the unit root in time-series is the augmented Dickey-Fuller (ADF) test. FDI-growth time-series causality studies that use ADF test include Khan and Leng (1997), Gyapong and Karikari (1999), Zhang (2001), Liu *et al.* (2002),

Ekanayake *et al.* (2003), Cuadros *et al.* (2004), Chowdhury and Mavrotas (2006), Hsiao and Hsiao (2006), Chang (2007), Qi (2007), Duttaray *et al.* (2008), Ang (2009), Iyer *et al.* (2009) and Liu *et al.* (2009). However, Hsiao and Hsiao (2006) argue that the DF-GLS test (Elliot *et al.*, 1996) for unit root has higher power in the sense that it is more likely to reject the null hypothesis of a unit root and accept the alternative hypothesis of no unit root. Therefore Hsiao and Hsiao (2006) use both ADF test and DF-GLS test for unit root. So we follow their method and apply both tests for comparison.

Table 4.1 presents the results from the ADF and DF-GLS unit root tests for each country. The details of unit root tests are shown in Appendix 9.1. From Table 4.1, we summarize the order of integration, which is presented in Table 4.2.

4.5.2 Optimum lags

There are different criteria for choosing optimum lag length including Akaike's information criterion (AIC), the final prediction error (FPE), the Hannan-Quinn information criterion (HQIC), likelihood ratio (LR) test, and Schwarz's Bayesian information criterion (SBIC). Most time-series causality studies use only one criterion to select optimum lag order (Ericsson and Irandoust, 2001; Zhang, 2001; Ekanayake *et al.*, 2003; Chowdhury and Mavrotas, 2006; Hsiao and Hsiao, 2006; Chang, 2007; Qi, 2007; Duttaray *et al.*, 2008; Ang, 2009; Lee, 2009; Liu *et al.*, 2009). However, we employ all five criteria to select the optimum lag in order to show a broad picture. Table 4.3 presents the number of optimum lags for each country according to the above five criteria.

Table 4.1 Unit root test results

		Australia	Austria	Canada	Denmark	Finland	France	Germany	Ireland	Italy	Japan
FDI inflows	DF-GLS test	I(0)	Unknown	I(0)	I(1)	Unknown	I(1)	I(1)	I(1)	I(2)	I(1)
	ADF test	I(0)	I(1)	I(1)	I(1)	I(2)	I(1)	I(1)	Unknown	I(1)	I(1)
FDI outflows	DF-GLS test	I(0)	I(1)	Unknown	I(0)	I(1)	I(0)	I(0)	I(1)	Unknown	I(1)
	ADF test	I(0)	I(1)	Unknown	I(0)	I(1)	I(0)	I(0)	I(2)	I(1)	Unknown
GDP growth rate	DF-GLS test	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(2)	I(0)	I(1)
	ADF test	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(2)	I(1)	I(1)
		Korea	Netherlands	New Zealand	Norway	Portugal	Spain	Sweden	Switzerland	UK	US
FDI inflows	DF-GLS test	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(2)	I(0)	I(0)
	ADF test	I(1)	I(1)	I(0)	I(1)	I(1)	I(2)	I(1)	I(2)	I(0)	I(0)
FDI outflows	DF-GLS test	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(0)	I(0)	I(0)	I(2)
	ADF test	Unknown	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(0)	I(0)	I(2)
GDP growth rate	DF-GLS test	I(1)	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	Unknown	I(0)
	ADF test	I(1)	I(1)	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(2)

Note: Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990.

Table 4.2 The number of integration order		
Country	DF-GLS test	ADF test
Australia	0	1
Austria	1	1
Canada	0	1
Denmark	1	1
Finland	1	2
France	1	1
Germany	1	1
Ireland	2	2
Italy	2	1
Japan	1	1
Korea	1	1
Netherlands	1	1
New Zealand	1	1
Norway	1	1
Portugal	1	1
Spain	1	2
Sweden	1	1
Switzerland	2	2
UK	0	0
US	2	2
Note: Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990.		

Table 4.3 Optimum lags					
Country	LR	FPE	AIC	HQIC	SBIC
Australia	4	1	4	1	1
Austria	4	4	4	4	4
Canada	4	4	4	4	1
Denmark	4	0	0	0	0
Finland	4	4	4	4	0
France	4	4	4	4	4
Germany	4	2	4	2	1
Ireland	4	4	4	4	1
Italy	4	1	4	1	1
Japan	4	1	4	1	1
Korea	2	2	2	2	1
Netherlands	4	2	2	2	2
New Zealand	4	4	4	4	0
Norway	3	3	3	3	0
Portugal	3	3	3	3	3
Spain	4	4	4	4	1
Sweden	4	1	1	1	1
Switzerland	4	4	4	4	4
UK	3	1	3	1	1
US	4	1	4	1	1

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) Duttaray *et al.* (2008) set the maximum lag length as 4 using 27 observations and Qi (2007) sets the maximum lag length as 5 using 34 observations. The maximum lag is set as 4 for all countries as the number of observation is 28.

4.5.3 Diagnostic Tests

In the time-series causality literature, most studies do not mention, or do not report diagnostic tests results (Khan and Leng, 1997; Zhang, 2001; Alguacil *et al.*, 2002; Ekanayake *et al.*, 2003; Asheghian, 2004; Cuadros *et al.*, 2004; Hsiao and Hsiao, 2006; Qi, 2007; Duttaray *et al.*, 2008; Iyer *et al.*, 2009; Liu *et al.*, 2009).

However, three diagnostic tests are conducted to test the model, namely skewness statistic, kurtosis statistic and the Jarque-Bera statistic tests for normally distributed disturbances after VAR, Lagrange Multiplier (LM) test for residual autocorrelation after VAR, stability test to check stability condition of VAR. These diagnostic tests are carried out using different combinations of integration order (Table 4.2) and optimal lags (Table 4.3). According to Toda and Yamamoto (1995), (k+1)-th order VAR model should be estimated when the optimal lag length is k and the order of integration is zero. Therefore the maximum order of integration d is one when the order of integration in Table 4.2 is zero. Details of Diagnostic tests are in Appendix 9.2. Table 4.4 presents the diagnostic tests results using the best combinations of optimum lags and maximum order of integration for each country. However, most of these countries do not satisfy all three diagnostic tests, which means that the econometric model could be mis-specified and the analysis results could be biased for some countries.

Table 4.4 Summary of diagnostic tests					
Country	Optimum lag *k*	Maximum order of integration *d*	Normality tests	LM test	Stability test
Australia	1	1	X	√	√
Austria	4	1	X	X	X
Canada	1	1	X	X	√
Denmark	4	1	√	X	X
Finland	4	1	√	√	X
France	4	1	√	√	X
Germany	4	1	√	√	X
Ireland	4	2	X	X[a]	X
Italy	1	1	X	√	√
Japan	1	1	X	√[a]	√
Korea	2	1	√[a]	√	√
Netherlands	4	1	X	√	X
New Zealand	4	1	√	X	√
Norway	3	1	√	√	X
Portugal	3	1	√	√	√
Spain	1	1	X	X	√
Sweden	4	1	√	X	√
Switzerland	4	2	X	X[a]	X
UK	1	1	X	√	√
US	4	2	√[a]	X[a]	X

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) Normality tests include skewness statistic, kurtosis statistic and the Jarque-Bera statistic tests for normally distributed disturbances after VAR. The null hypothesis is that the errors are normally distributed after VAR at 10% level. √ means that the null hypothesis is accepted at 10% level. √[a] means the null hypothesis is accepted at 5% level, but rejected at 10% level. X means the null hypothesis is rejected at both 5% level and 10% level. (3) In Lagrange-multiplier (LM) test for residual autocorrelation after VAR, the null hypothesis is that the residual is not auto-correlated after VAR at 10% level. √ means that the null hypothesis is accepted at 10% level until lag 4, √[a] means the null hypothesis is accepted at 5% level, but rejected at 10% level until lag 4. X means the null hypothesis is rejected at both 5% and 10% level until lag 4. X[a]: the exogenous variables may not be collinear with the dependent variables or their lags. (4) In stability test, √ means that the VAR model satisfies stability condition and X means that the VAR model does not satisfy stability condition.

4.5.4 Causality tests

Table 4.5 shows the causality test results and Table 4.6 summarizes the causal relationship between FDI inflows/outflows and the growth rate of GDP. The analysis results indicate a one-way relationship from FDI inflows to growth in two countries (Australia and Sweden), a one-way relationship from growth to FDI inflows in two countries (Japan and Korea), a two-way relationship in eleven countries (Austria, Denmark, Finland, France, Ireland, Netherlands, New Zealand, Norway, Portugal,

Switzerland and US) and no causal relationship in five countries (Canada, Germany, Italy, Spain and UK). In terms of the link between FDI outflows and growth, the causal link runs from FDI outflows to growth for four countries (Australia, France, New Zealand and Norway), the reverse causality is found in four countries (Germany, Korea, Portugal and UK), the bi-directional causality exists for eight countries (Austria, Denmark, Finland, Ireland, Netherlands, Sweden, Switzerland and US) and no causality is found in four countries (Canada, Italy, Japan and Spain).

Table 4.5 Causality test results

Country	FDI inflows → GDP growth	GDP growth → FDI inflows	FDI outflows → GDP growth	GDP growth → FDI outflows
Australia (k=1, d=1)	6.32** (0.0119)	2.37 (0.1239)	7.47*** (0.0063)	0.46 (0.4966)
Austria (k=4, d=1)	11.22** (0.0242)	17.81*** (0.0013)	9.92** (0.0418)	27.13*** (0.0000)
Canada (k=1, d=1)	2.58 (0.1082)	1.00 (0.3171)	0.56 (0.4562)	0.96 (0.3265)
Denmark (k=4, d=1)	23.91*** (0.0001)	25.07*** (0.0000)	25.60*** (0.0000)	47.13*** (0.0000)
Finland (k=4, d=1)	22.04*** (0.0002)	56.90*** (0.0000)	16.37*** (0.0026)	42.52*** (0.0000)
France (k=4, d=1)	23.99*** (0.0001)	13.76*** (0.0081)	29.36*** (0.0000)	4.26 (0.3717)
Germany (k=4, d=1)	4.00 (0.4054)	1.36 (0.8508)	5.01 (0.2864)	12.42** (0.0145)
Ireland (k=4, d=2)	40.90*** (0.0000)	45.16*** (0.0000)	25.28*** (0.0000)	18.58*** (0.0009)
Italy (k=1, d=1)	0.90 (0.3423)	0.14 (0.7130)	0.91 (0.3408)	0.24 (0.6253)
Japan (k=1, d=1)	2.65 (0.1037)	4.46** (0.0346)	0.09 (0.7694)	1.48 (0.2241)
Korea (k=2, d=1)	3.72 (0.1556)	8.78** (0.0124)	0.25 (0.8841)	13.42*** (0.0012)
Netherlands (k=4, d=1)	8.36* (0.0792)	19.59*** (0.0006)	13.16** (0.0105)	21.64*** (0.0002)
New Zealand (k=4, d=1)	17.93*** (0.0013)	9.65** (0.0468)	24.64*** (0.0001)	4.74 (0.3152)
Norway (k=3, d=1)	6.99* (0.0722)	8.95** (0.0299)	7.34* (0.0619)	0.98 (0.8055)
Portugal (k=3, d=1)	17.95*** (0.0005)	18.23*** (0.0004)	5.84 (0.1196)	15.50*** (0.0014)
Spain (k=1, d=1)	0.47 (0.4921)	0.02 (0.8880)	0.17 (0.6787)	0.58 (0.4462)

Sweden (k=4, d=1)	23.33*** (0.0001)	2.11 (0.7161)	14.01*** (0.0073)	17.03*** (0.0019)
Switzerland (k=4, d=2)	177.36*** (0.0000)	53.72*** (0.0000)	383.16*** (0.0000)	24.48*** (0.0001)
UK (k=1, d=1)	0.08 (0.7816)	0.44 (0.5087)	0.00 (0.9831)	2.83* (0.0925)
US (k=4, d=2)	29.43*** (0.0000)	21.12*** (0.0003)	18.73*** (0.0009)	33.79*** (0.0000)

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) Null hypothesis: FDI inflows/outflows does not Granger cause GDP growth or GDP growth does not Granger cause FDI inflows/outflows. (3) The number in brackets shows the Wald Chi-square significance level. (4) ***, **, * denote rejection of null hypothesis at the 1%, 5% and 10% level of significance respectively.

Table 4.6 Summary of causality tests

		Countries
Relationship between FDI inflows and growth	FDI → growth	Australia, Sweden
	FDI ← growth	Japan, Korea
	FDI ↔ growth	Austria, Denmark, Finland, France, Ireland, Netherlands, New Zealand, Norway, Portugal, Switzerland, US
	No causality	Canada, Germany, Italy, Spain, UK
Relationship between FDI outflows and growth	FDI → growth	Australia, France, New Zealand, Norway
	FDI ← growth	Germany, Korea, Portugal, UK
	FDI ↔ growth	Austria, Denmark, Finland, Ireland, Netherlands, Sweden, Switzerland, US
	No causality	Canada, Italy, Japan, Spain

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) It is significant at 10% level.

4.5.5 FDI-growth relationship and country-specific factors

As shown in Table 4.6, different countries experience different FDI-growth relationships, hence we analyse whether the reasons depend on country-specific factors (e.g. financial development, GDP per capita, trade openness, domestic investment, R&D expenditure, inflation rate, corporate tax revenue, trade union density, employment protection legislation index and unemployment rate). For example, we try to investigate whether countries with good financial development, higher GDP per capita etc experience FDI-led growth.

Financial development is measured as domestic credit to private sector as a percentage of GDP, GDP per capita is measured in constant 2000 US dollars, trade openness is measured as the sum of imports and exports of goods and services as a percentage of GDP. Domestic investment is measured as gross capital formation as a percentage of GDP, R&D expenditure is measured as gross domestic expenditure on R&D as a percentage of GDP, inflation rate is measured as the annual percentage change of consumer price index. Corporate tax revenue is corporate tax revenue on profits and capital gains as a percentage of GDP, trade union density is measured as trade union members as a percentage of total number of wage and salary earners. A higher employment protection index shows a stricter employment regulation. Unemployment rate is measured as the total unemployment as a percentage of total labour force. We find the average data on these country-specific factors for each country based on causality test period and data availability, and then compare period average data with FDI-growth relationship for each country (see Appendix 9.3). However, the period average data on country specific factors in Appendix 9.3 do not provide evidence why different countries follow different patterns in FDI-growth relationship.

The reasons for not being able to find a pattern on FDI-growth relationship might be due to the limitations of Granger causality test proposed by Toda and Yamamoto (1995). First, the causality test suffers from inefficiency because of the artificially augmented lag (Kurozumi and Yamamoto, 2000). In addition, although the empirical size of the test statistic is less distorted when the sample size is small, but the approach is not completely free from size distortion and it still has a large size distortion in some cases (Kurozumi and Yamamoto, 2000). Another limitation is that the causality test only examines the directions of causal links between inflows/outflows and economic growth,

but does not check whether the causal links are positive or negative. Finally, most sample countries do not satisfy all diagnostic test, so the econometric model could be mis-specified.

4.6 Conclusion

In conclusion, this chapter investigates the causal relationship between FDI inflows/outflows and economic growth for a group of 20 developed OECD countries. Most previous studies focus on the link between FDI inflows and growth in developing countries. This chapter tries to fill in the literature gap by analysing both the inflows-growth and outflows-growth relationship in developed countries. The results show that the majority of countries experience bi-directional causality between FDI inflows/outflows and economic growth. However, FDI-growth relationship does not depend on country specific factors such as financial development, GDP per capita, trade openness, domestic investment, R&D expenditure, inflation rate, corporate tax revenue, trade union density, employment protection legislation index and unemployment rate. The causality test divides the sample countries into 4 groups – countries which experience FDI-led growth, countries which experience growth-led FDI, countries which experience bi-directional causality and countries which do not experience causality. The next chapter will examine the determinants of FDI inflows/outflows for each group.

5 The determinants of inward and outward FDI based on causality test results

5.1 Introduction

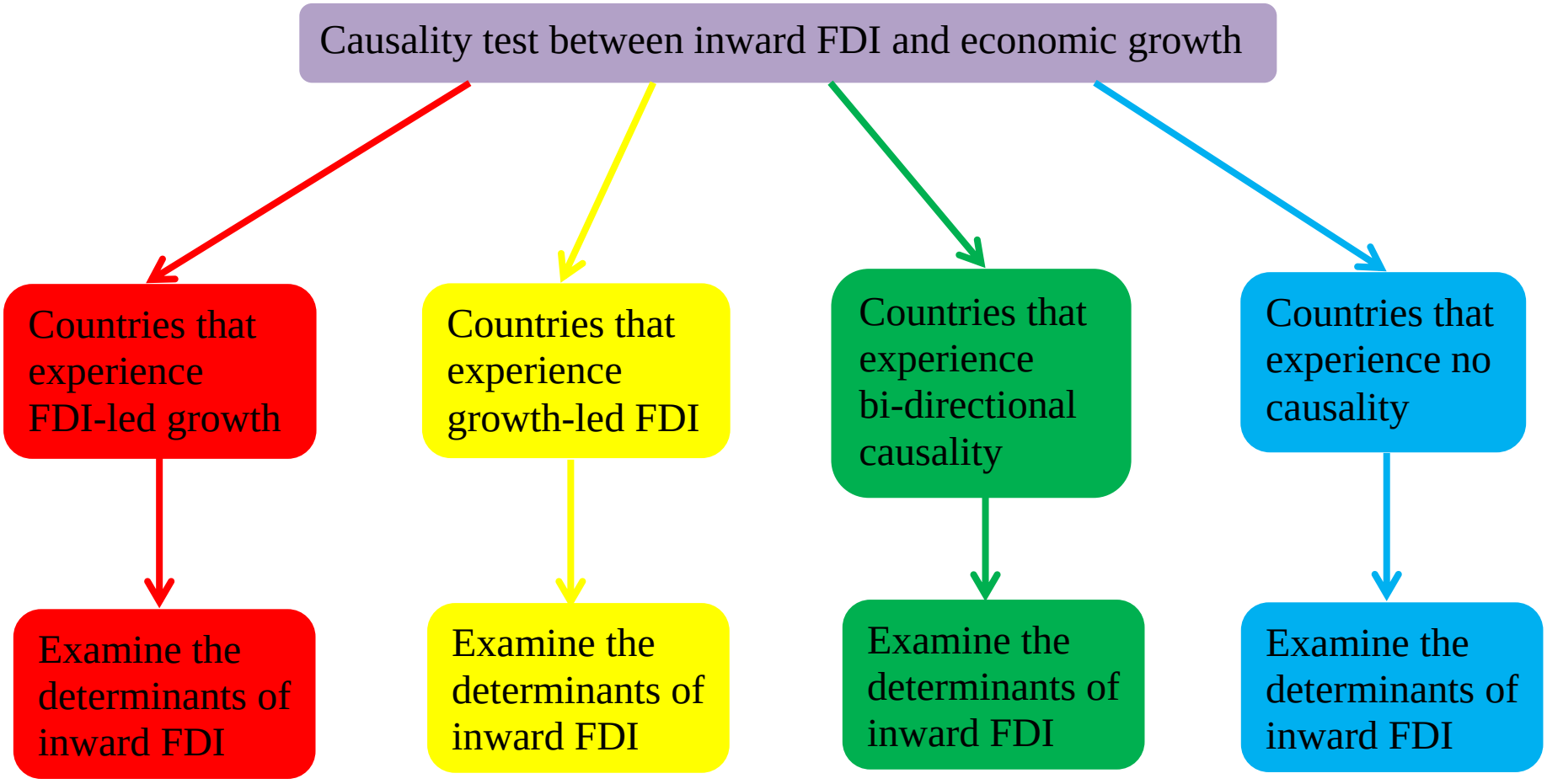
The rapid increase in inward FDI and the recognition of the benefits of inward FDI have motivated the studies on the determinants of FDI locations. Chapter 4 examines the causal relationship between FDI inflows/outflows and economic growth with the analysis dividing the sample into four groups – countries that experience FDI-led growth, countries that experience growth-led FDI, countries that experience bi-directional causality, countries that do not experience causality. The objective of this chapter is to investigate what factors attract FDI into a country and what factors encourage FDI abroad for each country group (see Figures 5.1 and 5.2).

This research extends the previous empirical evidence on the determinants of FDI inflows/outflows on several directions. First, a large number of studies on developing countries have been conducted on the determinants of FDI inflows, but the effectiveness of developed countries in attracting FDI using aggregate country-level data has not been analysed sufficiently due to limited studies on this area. Current studies on developed countries employ firm level FDI data (Kogut and Chang, 1991; Ford and Strange, 1999; Vannoni, 1999), industry level FDI data (Bandera and White, 1968; Scaperlanda and Balough, 1983; Moore, 1993; Cooke, 1997; Love, 2003; De Vita and Abbott, 2007) or bilateral FDI data (Cushman, 1987; Culem, 1988; Barrell and Pain, 1996, Filippaios *et al.*, 2003, Ham and Kleiner, 2007; Wijeweera *et al.*, 2007). However, there are a limited number of studies using aggregate FDI inflow data from the rest of the world, including Bajo-Rubio and Sosvilla-Rivero (1994) on Spain, Billington (1999) on 7 developed countries, Globerman and Shapiro (1999) on Canada, Lipsey (2000) on 22 developed

countries, Yang *et al.* (2000) on Australia, Kottaridi (2005) on 10 developed countries, Wijeweera and Clark (2006) on US, Radulescu and Robson (2008) on 19 developed OECD countries. Second, there is a dearth of research on the factors that affect FDI outflows. Only five current studies apply aggregate country level data and analyse the determinants of FDI outflows in developed countries, including Shapiro (1980) on US, Globerman and Shapiro (1999) on Cananda, Lipsey (2000) on 22 developed countries, Kyrkilis and Pantelidis (2003) on 6 developed countries, Wang and Wong (2007) on 25 developed countries. In addition, this study examines the importance of host/home country labour market flexibility on FDI inflows/outflows after taking a wide set of control variables into consideration. Moreover, a panel 2SLS simultaneous equations model is applied to allow economic growth to be endogenous.

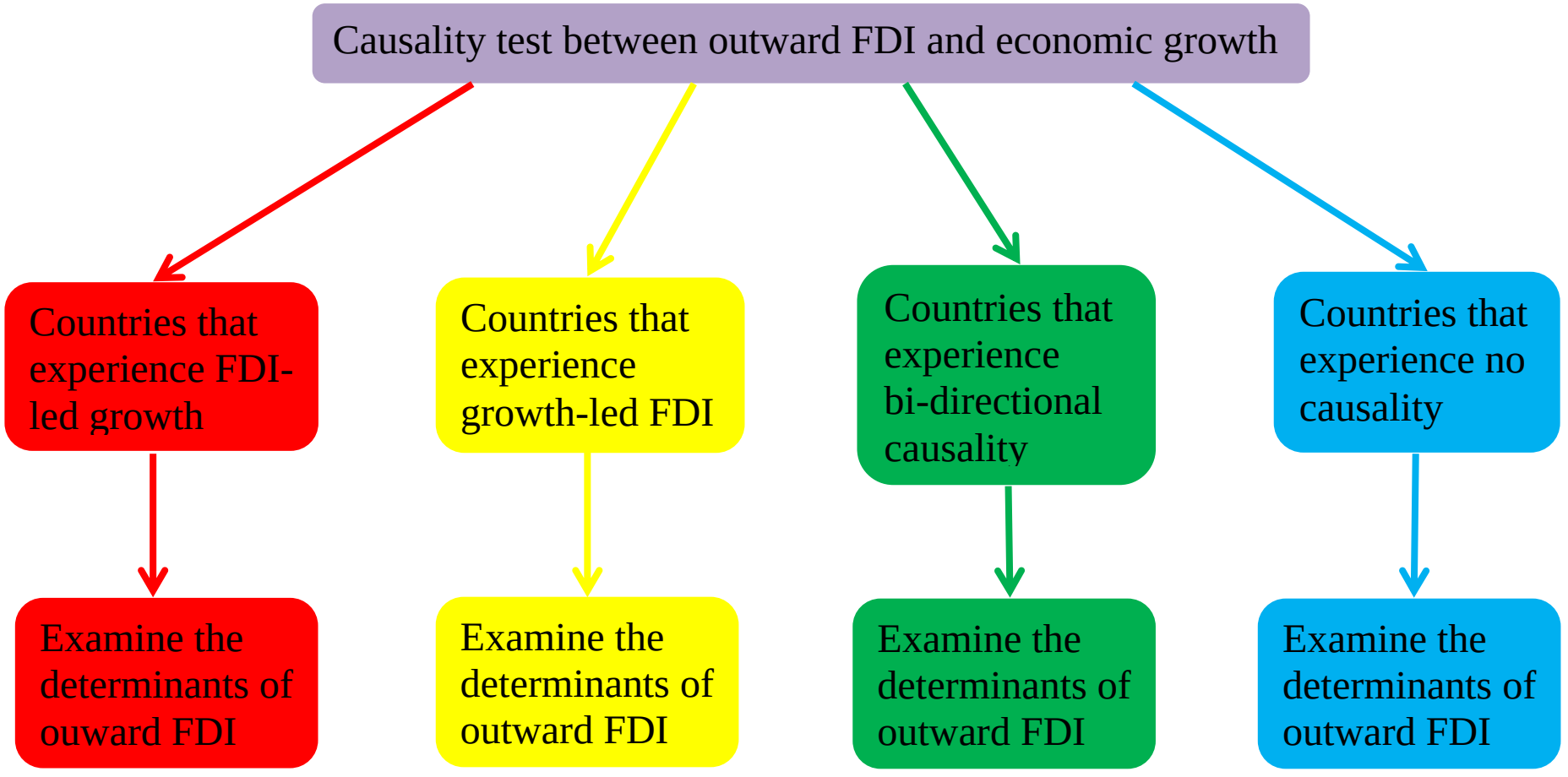
The structure of this chapter is organized as follows. Section 5.2 discusses the explanatory variables. The next two sections contain econometric methodology and the estimation model. Section 5.5 describes variables and presents data sources. Data analysis is reported in Section 5.6. Finally, it ends with conclusion.

Figure 5.1 The links between inward FDI's relationship with economic growth and its determinants



Source: Author's own work.

Figure 5.2 The links between outward FDI's relationship with economic growth and its determinants



Source: Author's own work.

5.2 Explanatory variables

Chapter 3 indicated that the host country factors that affect inward FDI in developing countries are labour cost, trade union density, employment protection legislation, wage bargaining coordination, market size, economic growth, agglomeration, trade barrier, trade openness, exchange rate, inflation rate, corporate tax, human capital, infrastructure, political instability, country risk, corruption and rule of law. In contrast, the determinants of inward FDI in developed countries are labour cost, trade union density, employment protection legislation, wage bargaining coordination, R&D expenditure, market size, economic growth, agglomeration, trade barrier, trade openness, exchange rate, inflation rate, corporate tax and human capital. Developed countries have a good level of infrastructure and good legal systems. In addition, they are politically stable and less corrupt. Therefore, infrastructure, political stability, country risk, corruption and rule of law are not important determinants of inward FDI in developed countries.

Of the remaining determinants, wage bargaining coordination is not used in this study, as the degree of wage bargaining coordination tends to be high in highly unionized countries (Radulescu and Robson, 2008). Hence, wage bargaining coordination and trade union density might be highly correlated. In addition, data on wage bargaining coordination from Ochel (2000), OECD (2004) and Nickell (2006) are only available until 2000. Moreover, trade barrier is not included as an explanatory variable, as it is relatively low in developed countries due to globalization and most recent studies use trade openness variable instead of trade barrier (Greenaway *et al.*, 2007; Naude and Krugell, 2007; Ang, 2008; Radulescu and Robson, 2008; Bhaumik and Dimova, 2009; Fukumi and Nishijima, 2010). Furthermore, trade openness indicates the level of trade

barrier such that a higher level of trade openness is associated with a lower level of trade barrier.

Market size is normally measured in real GDP, however, it is not included as an explanatory variable since the inclusion of real GDP and economic growth may raise a technical problem as economic growth is the growth rate of real GDP. Moreover, global trade liberalization allows multinational firms to set up production facilities in a host country and export the outputs to other countries rather than selling to local customers in the host country (Blomstrom and Kokko, 2003). Hence, this has reduced the importance of market size as a determinant of FDI inflows. Therefore, access to international markets is particularly important and trade openness is used to measure it. Furthermore, Gastanaga *et al.* (1998) argue that the size of country effect is dealt with by defining dependent variable as FDI as a percentage of GDP. Hence, some empirical studies do not include market size variable of real GDP, such as Gastanaga *et al.* (1998), Noorbakhsh *et al.* (2001), Asiedu (2002), Hsiao and Shen (2003), Naude and Krugell (2007). Finally, human capital is not used as an independent variable as school enrolment data in primary, secondary and tertiary education are only available from 1998 in Word Development Indicators (2011). Furthermore, developed countries have good human capital levels, less variation exists among countries and all studies on developed countries using aggregate FDI data (Bajo-Rubio and Sosvilla-Rivero, 1994; Billington, 1999; Globerman and Shapiro, 1999; Lipsey, 2000; Yang *et al.*, 2000; Kottaridi, 2005; Wijeweera and Clark, 2006; Radulescu and Robson, 2008) do not use human capital variable.

Therefore, the independent variables in the FDI inflows equation are past level of FDI stock, inflation rate, exchange rate, trade openness, corporate tax revenue, R&D expenditure, unit labour cost, trade union density and employment protection legislation index. The same variables are used to examine the determinants of FDI outflows following the approach of Globerman and Shapiro (1999, 2002), Lipsey (2000), whereby as Lipsey (2000) argues that the determinants of outward FDI might be the same economic characteristics as those of inward FDI. Furthermore, Globerman and Shapiro (1999, 2002) also believe that FDI outflows are stimulated by the same factors that attract FDI inflows as FDI inflows and outflows are symmetrical.

5.3 Methodology

Cross-country techniques are not used here as there are several potential drawbacks to this approach. First, cross-country analysis assumes that countries share common characteristics and does not take into account country-specific characteristics (Ericsson and Irandoust, 2001). Second, Giles and Williams (2000) point out that the cross-country regressions provide little insight into the way the various explanatory variables affect the dependent variable and the dynamic behaviours within countries. Moreover, cross-country models run increased risk of serious omitted variable bias due to both the lack of dynamics and degrees of freedom (Nair-Reichert and Weinhold, 2001). Finally, the cross-country analysis is unable to distinguish between the hypothesis that increased FDI has contributed to increased growth, versus the hypothesis that good growth has attracted more FDI (Nair-Reichert and Weinhold, 2001).

In contrast, panel data techniques allows the researchers to focus on the variations within a country over time, to control for country-specific and time invariant effects, and to reduce the omitted variable bias (Nair-Reichert and Weinhold, 2001; Yang,

2008). Panel GMM model is not used as we have a small sample size and long time period, whereas the model is more efficient on large sample size and short time period. However, if the sample size is small, the robust standard errors and the Arellano-Bond autocorrelation test may be unreliable. Moreover, if the time period is large, the numbers of instruments are big and the dynamic panel bias is insignificant (Roodman, 2006). Therefore, Panel fixed/random effect model and two stage least square instrumental variable estimation are employed.

5.3.1 Fixed/random effect model

According to Wooldridge (2003), the panel model is expressed as

$$Y_{it} = \beta_0 + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_k X_{itk} + u_{it} \qquad (5.1)$$

$$Y_{it} = \beta_0 + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_k X_{itk} + a_i + v_{it} \qquad (5.2)$$

Where *i* denotes a country, *t* denotes a time period, $X_1 ... X_k$ is a vector of explanatory variables. The error term u_{it} has two components: the time-constant error a_i and the time-varying error v_{it}. a_i represents the unobserved factors that do not change over time and influence Y_{it}. v_{it} represents the idiosyncratic error that changes over time and influences Y_{it}.

If we assume that the time-variant error v_{it} is uncorrelated with each explanatory variable across all time periods, the estimation of the model (5.2) can be developed in two directions: the fixed effects estimation and the random effects estimation. In the fixed effect estimation, the time-invariant error a_i is correlated with the explanatory variables. In the random effect model, a_i is not correlated with any explanatory variables.

5.3.1.1 Fixed effects estimation

Assuming the time-constant error a_i is correlated with explanatory variables and there is no intercept in equation (5.2), we average this equation over time for each *i* to get

$$\overline{Y_i} = \beta_1 \overline{X_{i1}} + \beta_2 \overline{X_{i2}} + \ldots + \beta_k \overline{X_{ik}} + a_i + \overline{v_i} \qquad (5.3)$$

Subtracting equation (5.3) from equation (5.2) for each *t*, we get

$$Y_{it} - \overline{Y_i} = \beta_1 (X_{it1} - \overline{X_{i1}}) + \beta_2 (X_{it2} - \overline{X_{i2}}) + \ldots + \beta_k (X_{itk} - \overline{X_{ik}}) + v_{it} - \overline{v_i} \quad (5.4)$$

Simplifying equation (5.4) to get

$$\ddot{Y}_{it} = \beta_1 \ddot{X}_{it1} + \beta_2 \ddot{X}_{it2} + \ldots + \beta_k \ddot{X}_{itk} + \ddot{v}_{it} \qquad (5.5)$$

where $\ddot{Y}_{it} = Y_{it} - \overline{Y_i}$, $\ddot{X}_{itk} = X_{itk} - \overline{X_{ik}}$ and $\ddot{v}_{it} = v_{it} - \overline{v_i}$

$\ddot{Y}_{it}$ is the time-demeaned data on *Y*, $\ddot{X}_{itk}$ is the time-demeaned data on X_k and $\ddot{v}_{it}$ is the time-demeaned data on v.

The use of pooled OLS estimation in equation (5.2) would be biased as it assumes no correlation between explanatory variables and error term. A pooled OLS regression based on the time-demeaned variables in equation (5.5) would solve this problem and it is fixed effects estimation. The purpose of fixed effects estimation is to eliminate the unobserved effect a_i if it is correlated with any explanatory variables at any time period.

5.3.1.2 Random effects estimation

If we assume that the time-invariant error a_i is not correlated with each explanatory variable in all time periods, equation (5.2) becomes a random effects model. As a_i is in the composite error u_{it} in each time period, the composite error u_{it} is serially correlated across time. The application of pooled OLS estimation would be biased as it assumes no serial correlation in the error term. Thus Generalized Least Squares (GLS) estimation is used to eliminate serial correlation. Averaging equation (5.1) in each *i* over time to get

$$\overline{Y_i} = \beta_0 + \beta_1 \overline{X_{i1}} + \beta_2 \overline{X_{i2}} + \ldots + \beta_k \overline{X_{ik}} + \overline{u_i} \qquad (5.6)$$

Subtracting the multiplication of λ and equation (5.6) from equation (5.1), we get quasi-demeaned data on each variable.

$$Y_{it} - \lambda\overline{Y_i} = \beta_0(1-\lambda) + \beta_1(X_{it1} - \lambda\overline{X_{i1}}) + \beta_2(X_{it2} - \lambda\overline{X_{i2}}) + \ldots + \beta_k(X_{itk} - \lambda\overline{X_{ik}}) + (u_{it} - \lambda\overline{u_i}) \quad (5.7)$$

Where $\lambda = 1 - [\sigma_v^2 / (\sigma_v^2 + T\sigma_a^2)]^{1/2}$, σ_a^2 is the variance of a_i, σ_v^2 is the variance of v_{it} and *T* is the number of time periods.

A pooled OLS regression based on the quasi-demeaned variables on equation (5.7) is therefore the random effect estimation.

5.3.1.3 Hausman test

The Hausman test is employed to guide us to the most appropriate technique: fixed effect or random effect. The null hypothesis of Hausman test is that time-invariant error a_i is not correlated with any explanatory variable in all time periods. If the null hypothesis is rejected, then the fixed effect model should be used. Whereas if the null hypothesis is accepted, the random effect model should be used.

5.3.2 Two stage least squares instrumental variables estimation

5.3.2.1 Two stage least squares estimation

Fixed effect/random effect models do not solve the problem that time-varying errors are correlated with the explanatory variables. Two stage least squares (2SLS) instrumental variables (IV) estimation can be used to solve the problem of endogeneity of one or more explanatory variables (Wooldridge, 2003). The structural equation is

$$Y_{it1} = \theta_1 + \alpha_1 Y_{it2} + \beta_1 X_{it1} + \beta_2 X_{it2} + \ldots + \beta_k X_{itk} + a_i + v_{it} \quad (5.8)$$

Where *i* denotes a country, *t* denotes a time period, $X_{it1} \ldots X_{itk}$ are exogenous explanatory variables and are uncorrelated with idiosyncratic error v_{it} across all time

periods, Y_{it2} is an endogenous variable and is correlated with v_{it}. The time-constant error a_i can be correlated with all explanatory variables.

If we remove the time-constant error a_i by first differencing, we get

$$\Delta Y_{it1} = \delta_1 + \alpha_1 \Delta Y_{it2} + \beta_1 \Delta X_{it1} + \beta_2 \Delta X_{it2} + ... + \beta_k \Delta X_{itk} + \Delta v_{it} \quad (5.9)$$

We assume that $\Delta X_{it1} ... \Delta X_{itk}$ are exogenous and are not correlated with the error term Δv_{it}. We cannot estimate the above equation (5.9) by OLS, as the error Δv_{it} is potentially correlated with explanatory variable ΔY_{it2}. So at least one instrumental variable is needed, which is correlated with ΔY_{it2} but not correlated with error term Δv_{it}. Suppose that we have two exogenous variables ΔZ_{it1} and ΔZ_{it2}, which do not appear in equation (5.9) and are only correlated with the explanatory variable ΔY_{it2}, the linear combination of the exogenous variables is a valid instrumental variable. This gives the reduced form equation for ΔY_{it2}.

$$\Delta Y_{it2} = \pi_0 + \pi_1 \Delta Z_{it1} + \pi_2 \Delta Z_{it2} + \pi_3 \Delta X_{it1} + ... + \pi_{k+2} \Delta X_{itk} + \Delta u_{it} \quad (5.10)$$

We need at least one of π_1 or π_2 to be different from zero. The equation (5.9) cannot be identified if both π_1 and π_2 are zero.

2SLS estimator can be obtained in two stages. The first stage is to run the reduced form regression in (5.10) by OLS and obtain the fitted values $\hat{\Delta Y}_{it2}$.

$$\hat{\Delta Y}_{it2} = \hat{\pi}_0 + \hat{\pi}_1 \Delta Z_{it1} + \hat{\pi}_2 \Delta Z_{it2} + \hat{\pi}_3 \Delta X_{it1} + ... + \hat{\pi}_{k+2} \Delta X_{itk} \quad (5.11)$$

The second stage is to run OLS regression using $\hat{\Delta Y}_{it2}$ instead of ΔY_{it2}.

$$\Delta Y_{it1} = \delta_1 + \alpha_1 \hat{\Delta Y}_{it2} + \beta_1 \Delta X_{it1} + ... + \beta_k \Delta X_{itk} + \Delta v_{it} \quad (5.12)$$

Alternatively, we can estimate equation (5.8) using the fixed effects transformation and then apply an IV technique. Equation (5.9) will become

$$\ddot{Y}_{it1} = \delta_1 + \alpha_1 \ddot{Y}_{it2} + \beta_1 \ddot{X}_{it1} + ... + \beta_k \ddot{X}_{itk} + \ddot{v}_{it} \quad (5.13)$$

$\ddot{Y}_{it1}$, $\ddot{Y}_{it2}$, $\ddot{X}_{itk}$, $\ddot{v}_{it}$ are the time-demeaned data on Y_{it1}, Y_{it2}, X_{itk}, v_{it}.

The reduced form equation for $\ddot{Y}_{it2}$ is

$$\ddot{Y}_{it2} = \pi_0 + \pi_1 \ddot{Z}_{it1} + \pi_2 \ddot{Z}_{it2} + \pi_3 \ddot{X}_{it1} + ... + \pi_{k+2} \ddot{X}_{itk} + \ddot{u}_{it} \quad (5.14)$$

$\ddot{Z}_{it1}$ and $\ddot{Z}_{it2}$ are IVs.

The first stage regression is to get the fitted values of $\ddot{Y}_{it2}$ in equation (5.14), the second stage is to run regression (5.13) using the fitted values of $\ddot{Y}_{it2}$ instead of $\ddot{Y}_{it2}$.

5.3.2.2 Two stage least squares simultaneous equations model

The simultaneous equations are shown below.

$$Y_{it1} = \theta_1 + \alpha_1 Y_{it2} + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_{k1} X_{itk1} + a_{i1} + v_{it1} \quad (5.15)$$

$$Y_{it2} = \theta_2 + \alpha_2 Y_{it1} + \gamma_1 W_{it1} + \gamma_2 W_{it2} + ... + \gamma_{k2} W_{itk2} + a_{i2} + v_{it2} \quad (5.16)$$

Where i denotes a country, t denotes a time period, $X_{it1} \ldots X_{itk1}$, $W_{it1} \ldots W_{itk2}$ are exogenous explanatory variables and are uncorrelated with the idiosyncratic errors v_{it1} and v_{it2}, Y_{it2} is endogenous in equation (5.12) and is correlated with v_{it1}, Y_{it1} is endogenous in equation (5.13) and is correlated with v_{it2}, the time-constant errors a_{i1} and a_{i2} can be correlated with all explanatory variables.

The rank condition for identifying equation (5.15) is that equation (5.16) contains at least one exogenous variable that is excluded from equation (5.15) and at least one of the exogenous variables has a non-zero coefficient in equation (5.16). Identification of equation (5.16) is the mirror image of identification of equation (5.15).

5.3.2.3 Endogeneity test

Endogeneity test of an explanatory variable shows whether the variable is endogenous. The null hypothesis is that the explanatory variable is exogenous and the alternative hypothesis is that the explanatory variable is endogenous. If the null hypothesis is accepted, the explanatory variable is exogenous and OLS estimation is appropriate. If the null hypothesis is rejected, then the explanatory variable is endogenous and 2SLS IV estimation is required.

5.3.2.4 Hansen test

One requirement of instrumental variables is that they must not be correlated with the time-varying error term. If there is one endogenous explanatory variable, we need to have at least one instrumental variable. The number of overidentifying restrictions is the number of extra instrumental variables. If there are two IVs for one endogenous explanatory variable, the number of overidentifying restriction is one. Hansen test is used to check the correlation between an endogenous variable and time-varying error term or the over-identifying restrictions. The null hypothesis is that instrumental variables are exogenous and overidentifying restrictions are valid. The alternative hypothesis is that some of the instrumental variables are not exogenous or are correlated with the time-varying error term.

5.4 Model specification

5.4.1 FDI-led growth country group

As economic growth does not significantly influence FDI inflows/outflows, we employ fixed/random effect model and incorporate FDI inflows/outflows and its possible determinants into equation (5.2)

$$Y_{it} = \beta_0 + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_k X_{itk} + a_i + v_{it} \qquad (5.2)$$

i: a country

t: a year

Y: the dependent variable which is FDI inflows/outflows as a percentage of GDP

k: the number of explanatory variables

a_i: time-invariant error

v_{it}: time-variant error

$X_1, X_2, ..., X_k$: a vector of explanatory variables including past level of FDI stock, inflation rate, exchange rate, trade openness, corporate tax revenue, R&D expenditure, unit labour cost, trade union density and employment protection legislation index.

5.4.2 Growth-led FDI country group

Economic growth has a significant impact on FDI inflows/outflows. In addition, it can be endogenous as it might be correlated with time-variant error term. Hence, we employ two stage least square model and incorporate FDI inflows/outflows and its possible determinants into equation (5.8)

$$Y_{it1} = \theta_1 + \alpha_1 Y_{it2} + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_k X_{itk} + a_i + v_{it} \quad (5.8)$$

i: a country

t: a year

Y_1: the dependent variable which is FDI inflows/outflows as a percentage of GDP

Y_2: economic growth rate which is endogenous

a_i: time-invariant error

v_{it}: time-variant error

$X_1 \ldots X_{k1}$: a vector of exogenous explanatory variables in equation including past level of FDI stock, inflation rate, exchange rate, trade openness, corporate tax revenue, R&D expenditure, unit labour cost, trade union density and employment protection legislation index.

5.4.3 Bi-directional causality country group

FDI inflows/outflows influence economic growth and economic growth affects FDI inflows/outflows. Therefore, both economic growth and FDI inflows/outflows are endogenous variables. Economic growth affects FDI inflows/outflows via equation (5.15) and FDI inflows/outflows in turn affect economic growth via equation (5.16). However, neglecting the interdependence between FDI inflows/outflows and economic growth may result in biased and inconsistent estimates. Hence, 2SLS simultaneous equations model is required to account for the simultaneity between economic growth and FDI inflows/outflows.

We incorporate FDI inflows/outflows and economic growth regressions into equations (5.15) and (5.16) respectively:

$$Y_{it1} = \theta_1 + \alpha_1 Y_{it2} + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_{k1} X_{itk1} + a_{i1} + v_{it1} \quad (5.15)$$

$$Y_{it2} = \theta_2 + \alpha_2 Y_{it1} + \gamma_1 W_{it1} + \gamma_2 W_{it2} + ... + \gamma_{k2} W_{itk2} + a_{i2} + v_{it2} \quad (5.16)$$

i: a country

t: a year

Y_1: the dependent variable in equation (5.15) which is FDI inflows/outflows as a percentage of GDP, it is endogenous in equation (5.16)

Y_2: the dependent variable in equation (5.16) which is economic growth rate, it is endogenous in equation (5.15)

a_i: time-invariant error

v_{it}: time-variant error

$X_1 \ldots X_{k1}$: a vector of exogenous explanatory variables in equation (5.15) including past level of FDI stock, inflation rate, exchange rate, trade openness, corporate tax revenue,

R&D expenditure, unit labour cost, trade union density and employment protection legislation index.

$W_1 \ldots W_{k2}$: a vector of exogenous explanatory variables in equation (5.16) including government consumption, domestic investment, R&D expenditure and inflation rate.

5.4.4 No-causality country group

Similarly with Section 5.4.1, we employ fixed/random effect model and incorporate FDI inflows/outflows and its possible determinants into equation (5.2)

$$Y_{it} = \beta_0 + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_k X_{itk} + a_i + v_{it} \qquad (5.2)$$

i: a country

t: a year

Y: the dependent variable which is FDI inflows/outflows as a percentage of GDP

k: the number of explanatory variables

a_i: time-invariant error

v_{it}: time-variant error

$X_1, X_2, ..., X_k$: a vector of explanatory variables including past level of FDI stock, inflation rate, exchange rate, trade openness, corporate tax revenue, R&D expenditure, unit labour cost, trade union density and employment protection legislation.

5.5 Data

5.5.1 Time period and country sample

The annual data covers the period 1981-2008. The time period starts from 1981 as the past level of FDI stock data is only available from 1981 and ends in 2008 as employment protection legislation index is only available until 2008. The sample has 20 developed OECD countries including Australia, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway,

Portugal, Spain, Sweden, Switzerland, UK and US. The time period and country sample are the same as those used in Chapter 4.

5.5.2 Definitions of variables and data sources

The dependent variable is the share of FDI inflows/outflows to GDP. FDI inflows/outflows values are not used as it is difficult to find a deflator to convert them into real values. The main interest of this empirical analysis is the sign and magnitude of the coefficients of labour market flexibility variables. The choice of the independent variables is motivated by the existing empirical studies and data availability.

Trade union density and employment protection legislation index are employed to control for the effect of labour market flexibility on FDI inflows. In the FDI inflows equation, strict labour market systems can hamper or encourage FDI inflows and the signs of the two variables can be positive or negative. R&D expenditure in the host country can have a positive or negative impact on FDI inflows. Past level of inward FDI stock and economic growth are expected to have positive effects on FDI inflows as discussed in Chapter 3. In contrast, inflation rate and corporate tax revenue play negative roles in affecting FDI inflows. For trade openness, exchange rate and unit labour costs, it is difficult to predict the signs of these variables (discussed in Chapter 3), so we allow these variables to have indeterminate signs. The definitions and the expected signs of the independent variables are shown in Table 5.1.

Table 5.1 Definitions and expected signs of independent variables for FDI inflows equation

	Dependent variable: FDI inflows as a percentage of GDP	
Independent variable	Definition	Sign
Agglomeration	One year lagged inward FDI stock as a percentage of GDP	+
Economic growth	Annual GDP growth rate (%)	+
Inflation rate	Inflation measured by the annual growth rate of CPI	–
Exchange rate	Real effective exchange rate index (ULC based) (2005=100) (an increase represents a real depreciation	+ or –

	of the currency)	
Trade openness	The sum of imports and exports of goods and services as a percentage of GDP	+ or –
Unit labour cost	Real unit labour cost index in total economy (2005=100)	+ or –
Corporate tax revenue	Corporate taxes on profits and capital gains as a percentage of GDP	–
R&D expenditure	Gross domestic expenditure on R&D as a percentage of GDP	+ or –
Union density	Trade union density (%)	+ or –
Employment protection legislation	A higher index shows a stricter regulation	+ or –
Notes: (1) Real effective exchange rate index (ULC based) takes into consideration changes in market exchange rate and variations in relative unit labour cost levels in manufacturing (OECD Stat Extracts, 2011). (2) Real unit labour cost is computed as total labour costs divided by nominal output (OECD Stat Extracts, 2011).		

In terms of FDI outflows equation, we expect positive or negative coefficients of union density and employment protection legislation (see Chapter 3). The impact of R&D expenditure on FDI outflows can be positive or negative (see Chapter 3). One year lagged outward FDI stock, economic growth, inflation rate and corporate tax revenue are expected to play positive roles in affecting FDI outflows. For labour cost, exchange rate, trade openness, it is difficult to predict the sign, so we allow it to have indeterminate signs (see Chapter 3). The definitions and the expected signs of the independent variables are shown in Table 5.2 and Table 5.3 presents data sources. The employment protection legislation index is originally from Nickell (2006), but then updated by the author from OECD Stat Extracts (2011), with details of calculation methods shown in Appendices 9.4 and 9.5.

Table 5.2 Definitions and expected signs of independent variables for FDI outflows equation

	Dependent variable: FDI outflows as a percentage of GDP	
Independent variable	Definition	Sign
Agglomeration	One year lagged outward FDI stock as a percentage of GDP	+
Economic growth	Annual GDP growth rate (%)	+
Inflation rate	Inflation measured by the annual growth rate of CPI	+
Exchange rate	Real effective exchange rate index (ULC based) (2005=100) (an increase represents a real depreciation	+ or –

	of the currency)	
Trade openness	The sum of imports and exports of goods and services as a percentage of GDP	+ or –
Unit labour cost	Real unit labour cost index in total economy (2005=100)	+ or –
Corporate tax revenue	Corporate taxes on profits and capital gains as a percentage of GDP	+
R&D expenditure	Gross domestic expenditure on R&D as a percentage of GDP	+ or –
Union density	Trade union density (%)	+ or –
Employment protection legislation	A higher index shows a stricter regulation	+ or –
Notes: (1) Real effective exchange rate index (ULC based) takes into consideration changes in market exchange rate and variations in relative unit labour cost levels in manufacturing (OECD Stat Extracts, 2011). (2) Real unit labour cost is computed as total labour costs divided by nominal output (OECD Stat Extracts, 2011).		

Table 5.3 Data sources

Variable	Data Source
FDI inflows/outflows as a percentage of GDP	World Development Indicators (2011)
Inward/outward FDI stock as a percentage of GDP	UNCTAD Foreign Direct Investment Database (2011)
GDP growth rate	World Development Indicators (2011)
Inflation measured by the annual growth rate of CPI	World Development Indicators (2011)
Real effective exchange rate index (ULC based) (2005=100)	OECD Stat Extracts (2011)
Imports of goods and services as a percentage of GDP	World Development Indicators (2011)
Exports of goods and services as a percentage of GDP	World Development Indicators (2011)
The sum of imports and exports of goods and services as a percentage of GDP	Author's calculation
Real unit labour cost index in total economy (2005=100)	OECD Stat Extracts (2011)
Corporate taxes on profits and capital gains as a percentage of GDP	OECD Stat Extracts (2011)
Gross domestic expenditure on R&D as a percentage of GDP	OECD Main Science and Technology Indicators (2010)
Trade union density	OECD Stat Extracts (2011)
Employment protection legislation index	Nickell (2006) and OECD Stat Extracts (2011)
General government final consumption expenditure as a percentage of GDP	World Development Indicators (2011)
Gross capital formation as a percentage of GDP	World Development Indicators (2011)
Notes: (1) Employment protection legislation data from 1985 to 2008 is from OECD Stat Extracts (2011),	

data before 1985 is from Nickell (2006).

5.6 Data analysis

5.6.1 The determinants of FDI inflows

For the countries which experience FDI-led growth (Australia and Sweden), economic growth does not significantly affect FDI inflows. Hence, economic growth is not included as an explanatory variable in FDI inflows equation and fixed/random effect estimation is used. The regression results based on panel fixed/random effect model are presented in Table 5.4. As the chi square statistics of Hausman test is negative, we cannot differentiate whether it is fixed effect or random effect. Therefore, the insignificant variables in Table 5.4 are excluded and Table 5.5 re-estimates the FDI inflows equation using significant variables – labour cost and employment protection legislation index. The hypothesis that the time-constant error is uncorrelated with the explanatory variables is rejected based on the Hausman test. The corresponding *p*-values of the test is 0.006, which shows that the fixed effect model is more appropriate than the random effect model. The coefficient of employment protection legislation index is negative and significant at 1% level, which means that strict employment legislation in the host country is a deterrent to FDI inflows. Labour cost variable is negative and marginally significant at the 10% level, which implies that low labour cost in the host country attracts FDI inflows.

Table 5.4 Robust fixed/random effect equations

	Dependent variable: FDI inflows as a percentage of GDP	
Independent variables	Fixed effect	Random effect
Inward FDI stock (-1)	-0.173 (-1.11)	-0.173 (-1.14)
Trade openness	0.183 (0.93)	0.192 (1.28)
Unit labour cost	-0.344* (-1.95)	-0.349** (-2.26)
Exchange rate	0.047 (0.84)	0.049 (1.07)

Corporate tax revenue	0.196 (0.33)	0.197 (0.34)
Union density	-0.080 (-0.59)	-0.068 (-1.34)
Employment protection legislation	-6.174 (-1.48)	-6.025* (-1.67)
Inflation rate	0.161 (0.64)	0.164 (0.68)
R&D expenditure	0.381 (0.76)	1.524 (0.87)
Countries	2	2
Observations	31	31

Notes: (1) All models are estimated with a constant. (2) Robust *t*-values or *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) The chi square statistics in the Hausman test is negative, model fitted on these data fails to meet the asymptotic assumptions of the Hausman test. Therefore, Hausman test does not indicate whether fixed or random effect is the most appropriate technique.

Table 5.5 Robust fixed effect equation

	Dependent variable: FDI inflows as a percentage of GDP
Independent variables	(1)
Inward FDI stock (-1)	
Trade openness	
Unit labour cost	-0.158[a] (-1.52)
Exchange rate	
Corporate tax revenue	
Union density	
Employment protection legislation	-3.662*** (-3.99)
Inflation rate	
R&D expenditure	
Countries	2
Observations	54
Hausman test (*p*-value)	10.23*** (0.0060)
Fixed/random effect	Fixed effect

Notes: (1) All models are estimated with a constant. (2) Robust *t*-values or *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) [a]: significant at 13.4% level.

For those countries which experience growth-led FDI (Japan and Korea), we expect that economic growth is a significant determinant of FDI inflows. Moreover, economic growth might be endogenous and be correlated with time-variant error. Therefore, 2SLS

estimation is applied in Table 5.6. Model (1) includes all explanatory variables, whilst Model (2) only includes the significant variables found in Model (1). The endogeneity test accepts the null hypothesis at the 10% level indicating that economic growth is exogenous. Therefore, FDI inflows equations are estimated using fixed/random effect models in Table 5.7 and Table 5.8. However, economic growth is found to be insignificant, which is contradictory to the causality test results in Chapter 4. This might be due to different estimation methods used in this Chapter and Chapter 4. In addition, the important variables that affect FDI inflows for this group of countries are past level inward FDI stock, trade openness, labour cost, employment protection legislation index, inflation rate and R&D expenditure.

Table 5.6 Robust two stage least squares equations

	Dependent variable: FDI inflows as a percentage of GDP	
Independent variables	(1)	(2)
Economic growth	-0.043* (-1.81)	-0.025 (-1.18)
Inward FDI stock (-1)	-0.069** (-2.35)	-0.042* (-1.83)
Trade openness	0.033*** (2.88)	0.039*** (4.27)
Unit labour cost	-0.051** (-2.35)	-0.056*** (-5.00)
Exchange rate	-0.0005 (-0.18)	
Corporate tax revenue	0.091 (1.58)	
Union density	-0.006 (-0.12)	
Employment protection legislation	-0.316 (-1.03)	
Inflation rate	-0.139*** (-3.55)	-0.128*** (-3.64)
R&D expenditure	-1.491*** (-4.27)	-1.497*** (-5.49)
Countries	2	2
Observations	46	46
Hansen test (*p*-value)	6.908*** (0.0086)	7.829*** (0.0051)
Endogeneity test (*p*-value)	0.659 (0.4169)	0.254 (0.6142)

Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) Economic growth is instrumented by government consumption and domestic investment in the host country.

Table 5.7 Robust fixed/random effect equations		
	Dependent variable: FDI inflows as a percentage of GDP	
Independent variables	Fixed effect	Random effect
Economic growth	-0.011 (-0.69)	-0.011 (-0.72)
Inward FDI stock (-1)	-0.077** (-2.53)	-0.090*** (-3.30)
Trade openness	0.033** (2.68)	0.028*** (2.90)
Unit labour cost	-0.038[a] (-1.57)	-0.040* (-1.67)
Exchange rate	0.001 (0.19)	-0.0002 (-0.06)
Corporate tax revenue	0.084 (1.37)	0.072 (1.26)
Union density	-0.025 (-0.46)	-0.001 (-0.01)
Employment protection legislation	-0.652* (-1.76)	-0.838*** (-2.73)
Inflation rate	-0.110*** (-3.06)	-0.109*** (-3.11)
R&D expenditure	-1.432*** (-3.98)	-1.217*** (-5.09)
Countries	2	2
Observations	46	46

Notes: (1) All models are estimated with a constant. (2) Robust *t*-values or *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) [a]: significant at 12.6% level. (5) The chi square statistics in the Hausman test is negative, model fitted on these data fails to meet the asymptotic assumptions of the Hausman test. Therefore, Hausman test does not indicate whether fixed or random effect is the most appropriate technique.

Table 5.8 Robust fixed/random effect equations		
	Dependent variable: FDI inflows as a percentage of GDP	
Independent variables	Fixed effect	Random effect
Economic growth		
Inward FDI stock (-1)	-0.069*** (-2.76)	-0.077*** (-3.19)
Trade openness	0.032*** (3.25)	0.025*** (4.57)
Unit labour cost	-0.041*** (-2.79)	-0.031 (-3.82)
Exchange rate		
Corporate tax revenue		

Union density		
Employment protection legislation	-0.650** (-2.21)	-0.926*** (-6.12)
Inflation rate	-0.097** (-2.65)	-0.087** (-2.46)
R&D expenditure	-1.246*** (-4.34)	-1.068*** (-4.75)
Countries	2	2
Observations	46	46

Notes: (1) All models are estimated with a constant. (2) Robust *t*-values or *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) The chi square statistics in the Hausman test is negative, model fitted on these data fails to meet the asymptotic assumptions of the Hausman test. Therefore, Hausman test does not indicate whether fixed or random effect is the most appropriate technique.

For countries which experience bi-directional causality (Austria, Denmark, Finland, France, Ireland, Netherlands, New Zealand, Norway, Portugal, Switzerland and US), we control the endogenity of both economic growth and FDI inflows by employing 2SLS simultaneous equations model in Table 5.9. We expect that FDI inflows contribute to economic growth and higher economic growth attracts FDI inflows. Model (1) includes all the explanatory variables, economic growth does not significantly affect FDI inflows equation in Table 5.9 and FDI inflows positively affect economic growth in Table 5.10. Model (2) re-examine the simultaneous equations models by removing the insignificant variables found in Model (1). Economic growth is found to increase FDI inflows and FDI inflows is found to have no impact on economic growth in Model (2). Again, the results are not what we expected and they are not consistent to the causality test results in Chapter 4. In addition, trade openness is found to positively affect FDI inflows, while strict employment protection legislation negatively affects FDI inflows.

Table 5.9 Robust two stage least squares simultaneous equations

	Dependent variable: FDI inflows as a percentage of GDP	
Independent variables	(1)	(2)
Economic growth	0.296 (1.07)	0.392* (1.82)
Inward FDI stock (-1)	-0.004 (-0.20)	
Trade openness	0.109**	0.127***

	(2.55)	(3.83)
Unit labour cost	-0.100 (-1.36)	
Exchange rate	-0.009 (-0.68)	
Corporate tax revenue	-0.061 (-0.25)	
Union density	0.021 (0.41)	
Employment protection legislation	-3.361*** (-2.73)	-2.439** (-2.28)
Inflation rate	0.084 (0.96)	
R&D expenditure	-1.204 (-1.16)	
Countries	11	11
Observations	254	306
Hansen test (*p*-value)	2.079 (0.1494)	4.260 (0.1188)
Endogeneity test (*p*-value)	1.303 (0.2537)	3.324* (0.0683)
Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.		

Table 5.10 Robust two stage least squares simultaneous equations		
	Dependent variable: Growth rate of real GDP	
Independent variable	(1)	(2)
FDI inflows	0.318* (1.71)	0.084 (1.50)
Government consumption	-0.523*** (-3.33)	-0.574*** (-5.36)
Domestic investment	0.176** (2.41)	0.138*** (3.18)
Trade openness	-0.035 (-1.14)	
Inflation rate	-0.135*** (-2.67)	-0.168*** (-4.66)
R&D expenditure	0.113 (0.24)	
Countries	11	11
Observations	254	306
Hansen test (*p*-value)	10.039* (0.0741)	0.196 (0.6583)
Endogeneity test (*p*-value)	1.796 (0.1802)	0.065 (0.7995)
Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.		

In terms of countries which do not experience causality between FDI inflows and growth (Canada, Germany, Italy, Spain and UK), economic growth variable is not included and fixed/random effect models are used. The important variables that influence FDI inflows in Table 5.11 are trade openness, corporate tax rate and trade union density.

Table 5.11 Robust fixed/random effect equations

	Dependent variable: FDI inflows as a percentage of GDP		
Independent variables	(1)	(2)	(3)
Inward FDI stock (-1)	-0.017 (-0.50)		
Trade openness	0.081** (2.35)	0.046*** (2.99)	0.039** (2.43)
Unit labour cost	0.106 (1.45)		
Exchange rate	0.045 (1.48)		
Corporate tax revenue	0.896** (2.36)	0.878*** (4.51)	0.850*** (4.45)
Union density	-0.085* (-1.75)	-0.087*** (-7.71)	-0.122*** (-5.18)
Employment protection legislation	-0.192 (-0.28)		
Inflation rate	-0.090* (-1.78)	-0.032 (-0.97)	
R&D expenditure	-1.448 (-1.28)		
Countries	5	5	5
Observations	126	129	140
Hausman test (*p*-value)	60.64*** (0.0000)	5.57 (0.2333)	0.26 (0.9667)
Fixed/random effect	Fixed effect	Random effect	Random effect

Notes: (1) All models are estimated with a constant. (2) Robust *t*-values or *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.

5.6.2 The determinants of FDI outflows

For countries which experience FDI-led growth (Australia, France, New Zealand, and Norway), economic growth has no significant impact on FDI outflows and fixed/random effect model is applied in Table 5.12. However, fixed/random effect

model cannot be differentiated due to the negative chi square statistics of Hausman test. Therefore, the insignificant variables in Table 5.12 are removed and Table 5.13 re-estimates the equation. The results indicate that high past level of outward FDI stock, high trade union density and rigid employment protection legislation in the home country encourage FDI outflows. However, trade openness and high labour cost in the home country negatively affect FDI outflows.

Table 5.12 Robust fixed/random effect equations		
	Dependent variable: FDI outflows as a percentage of GDP	
Independent variables	Fixed effect	Random effect
Outward FDI stock (-1)	0.026 (0.78)	0.046*** (2.80)
Trade openness	0.116 (0.69)	-0.050[a] (-1.60)
Unit labour cost	-0.167** (-2.13)	-0.193*** (-3.21)
Exchange rate	-0.006 (-0.22)	-0.013 (-0.65)
Corporate tax revenue	-0.077 (-0.29)	-0.079 (-0.68)
Union density	0.110* (1.98)	0.089*** (3.38)
Employment protection legislation	-0.819 (-0.50)	1.535** (2.12)
Inflation rate	-0.054 (-0.39)	0.082 (1.00)
R&D expenditure	0.263 (0.18)	1.197 (0.99)
Countries	4	4
Observations	74	74

Notes: (1) All models are estimated with a constant. (2) Robust *t*-values or *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) The chi square statistics in the Hausman test is negative, model fitted on these data fails to meet the asymptotic assumptions of the Hausman test. Therefore, Hausman test does not indicate whether fixed or random effect is the most appropriate technique. (5) [a]: significant at 10.9% level.

Table 5.13 Robust random effect equation	
	Dependent variable: FDI outflows as a percentage of GDP
Independent variables	(1)
Outward FDI stock (-1)	0.040*** (2.82)
Trade openness	-0.042** (-2.49)

Unit labour cost	-0.139*** (-4.32)
Exchange rate	
Corporate tax revenue	
Union density	0.065*** (3.99)
Employment protection legislation	1.652*** (4.54)
Inflation rate	
R&D expenditure	
Countries	4
Observations	106
Hausman test (*p*-value)	8.65 (0.1240)
Fixed/random effect	Random effect
Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.	

For countries which experience growth-led FDI (Germany, Korea, Portugal and UK), 2SLS technique is applied in Table 5.14. In Model (1), the endogeneity test shows that economic growth is not endogenous and it is not correlated with time-variant error. In addition, the coefficient of economic growth is not significant. After removing the insignificant variables, endogeneity test confirms the endogeniety of economic growth variable and Hansen test accepts the validity of the instruments at 10 percent level. Economic growth is found to have a positive impact on FDI outflows. Moreover, high corporate tax and low trade union density in the home country are associated with large FDI outflows.

Table 5.14 Robust two stage least squares equations			
	Dependent variable: FDI outflows as a percentage of GDP		
Independent variables	(1)	(2)	(3)
Economic growth	0.206 (1.32)	0.298** (1.98)	0.359** (2.12)
Outward FDI stock (-1)	-0.070* (-1.86)	-0.037 (-1.07)	
Trade openness	0.084* (1.65)	-0.011 (-0.50)	
Unit labour cost	0.098 (0.72)		
Exchange rate	0.055		

	(1.51)		
Corporate tax revenue	1.051*** (2.87)	0.938*** (3.17)	0.865*** (3.71)
Union density	-0.280*** (-2.72)	-0.329*** (-3.11)	-0.242*** (-3.93)
Employment protection legislation	-0.233 (-0.26)		
Inflation rate	0.011 (0.11)		
R&D expenditure	-2.142 (-1.42)		
Countries	4	4	4
Observations	81	81	81
Hansen test (*p*-value)	0.045 (0.8316)	2.298 (0.5130)	2.208 (0.6976)
Endogeneity test (*p*-value)	1.111 (0.2919)	7.097*** (0.0077)	8.280*** (0.0040)
Notes: (1) All models are estimated with a constant. (2) Robust z-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) In equation (1), economic growth is instrumented by government consumption and domestic investment in the home country. In equation (2), economic growth is instrumented by government consumption, domestic investment, inflation rate and R&D expenditure. In equation (3), economic growth is instrumented by government consumption, domestic investment, inflation rate, R&D expenditure and trade openness.			

For countries which experience bi-directional causality (Austria, Denmark, Finland, Ireland, Netherlands, Sweden, Switzerland and US), 2SLS simultaneous equations model is used in Tables 5.15 and 5.16. Economic growth is found to be significant in FDI outflows equation and FDI outflows is found to be insignificant in economic growth equation, which is contradictory to the bi-directional causality between FDI outflows and economic growth in Chapter 4.

Table 5.15 Robust two stage least squares simultaneous equations			
	Dependent variable: FDI outflows as a percentage of GDP		
Independent variables	(1)	(2)	(3)
Economic growth	0.207 (1.05)	0.515** (2.30)	0.598*** (2.73)
Outward FDI stock (-1)	0.042** (2.42)	0.063*** (4.54)	0.063*** (4.54)
Trade openness	0.032 (1.03)		
Unit labour cost	-0.164* (-1.91)	-0.083 (-1.11)	
Exchange rate	0.020		

	(1.47)		
Corporate tax revenue	1.447* (1.68)	1.195* (1.83)	1.524*** (2.82)
Union density	-0.020 (-0.27)		
Employment protection legislation	-1.342 (-1.38)		
Inflation rate	0.116 (1.22)		
R&D expenditure	-1.561 (-1.25)		
Countries	8	8	8
Observations	185	217	217
Hansen test (*p*-value)	2.788* (0.0950)	9.147*** (0.0025)	8.621*** (0.0033)
Endogeneity test (*p*-value)	1.021 (0.3123)	1.611 (0.2043)	2.037 (0.1535)
Notes: (1) All models are estimated with a constant. (2) Robust z-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.			

Table 5.16 Robust two stage least squares simultaneous equations			
	Dependent variable: Growth rate of GDP		
Independent variable	(1)	(2)	(3)
FDI outflows	0.002 (0.02)	0.015 (0.30)	-0.016 (-0.32)
Government consumption	-0.818*** (-3.74)	-0.885*** (-5.64)	-0.916*** (-5.76)
Domestic investment	0.027 (0.37)		
Trade openness	0.014 (0.60)		
Inflation rate	-0.165** (-2.16)	-0.137** (-2.55)	-0.145*** (-2.65)
R&D expenditure	-0.311 (-0.74)		
Countries	8	8	8
Observations	185	217	217
Hansen test (*p*-value)	17.872*** (0.0031)	9.909*** (0.0071)	3.494* (0.0616)
Endogeneity test (*p*-value)	0.898 (0.3434)	0.388 (0.5333)	1.362 (0.2432)
Notes: (1) All models are estimated with a constant. (2) Robust z-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.			

For countries which do not experience causality between the two variables (Canada, Italy, Japan and Spain), economic growth is not included as an independent variable and Table 5.17 shows the estimation results. The important determinants of FDI outflows for this group of countries are trade openness, exchange rate, corporate tax and employment protection legislation index.

Table 5.17 Robust fixed/random effect equations

	Dependent variable: FDI outflows as a percentage of GDP		
Independent variables	(1)	(2)	(3)
Outward FDI stock (-1)	0.018 (0.41)		
Trade openness	0.110*** (3.28)	0.136*** (8.40)	0.132*** (8.51)
Unit labour cost	-0.003 (-0.16)		
Exchange rate	0.026*** (2.79)	0.028*** (4.81)	0.027*** (4.73)
Corporate tax revenue	0.645*** (4.67)	0.562*** (4.24)	0.605*** (4.46)
Union density	-0.078*** (-4.89)	0.031 (1.06)	
Employment protection legislation	0.357** (2.54)	-0.400* (-1.68)	-0.365[a] (-1.62)
Inflation rate	-0.0003 (-0.01)		
R&D expenditure	0.083 (0.30)		
Countries	4	4	4
Observations	111	112	112
Hausman test (*p*-value)	9.36 (0.4047)	10.04* (0.0741)	18.72*** (0.0009)
Fixed/random effect	Random effect	Fixed effect	Fixed effect

Notes: (1) All models are estimated with a constant. (2) Robust *t*-values or *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) [a]: significant at 10.8% level.

5.7 Conclusion

In conclusion, the purpose of this chapter is to examine the determinants of FDI inflows and outflows based on causality test results in Chapter 4. The explanatory variables that might affect FDI inflows/outflows are economic growth, past level of FDI stock, trade

openness, labour cost, exchange rate, corporate tax, trade union density, employment protection legislation index, inflation rate and R&D expenditure. However, the results on the determinants of FDI inflows/outflows are contradictory to the causality test results in Chapter 4. For example, the causality test results in Chapter 4 show that economic growth Granger cause FDI inflows for a group of countries. However, the analysis of the determinants of FDI inflows for this group of countries shows that economic growth is not a significant determinant of FDI inflows.

The reason for the inconsistency in the results in Chapter 4 and this Chapter is likely to be that Chapter 4 only examines the relationship between FDI inflows/outflows and economic growth, thereby ignoring other factors that may also affect FDI inflows/outflows or economic growth. In contrast, this chapter includes the other variables that might influence FDI inflows/outflows and economic growth. Therefore, the analysis results are different and are contradictory to each other.

In addition, it should be noted that there are potential problems in using the Granger causality test proposed by Toda and Yamamoto (1995). According to Kurozumi and Yamamoto (2000), the causality test suffers from inefficiency because of the artificially augmented lag. In addition, although the empirical size of the test statistic is less distorted when the sample size is small, but the approach is not completely free from size distortion and it still has a large size distortion in some cases (Kurozumi and Yamamoto, 2000). Another limitation is that the causality test only examines the directions of causal links between inflows/outflows and economic growth and assume the causal links are positive. Furthermore, there are some criticisms about causality test. First, it relates to the final equations of an econometric system, whereby this

information is different in nature from the economic causation used in building a structural model (Osborn, 1984). Second, the number of variables involved and the maximum lag order to be considered are large in reality (Osborn, 1984). Third, the tests of choosing optimal lag length are not designed to estimate coefficients in a regression whose lag length may be infinite (Geweke, 1984). Moreover, causality test result is sensitive to the lag specification (Vilasuso, 2001). In addition, time aggregation bias might lead to spurious causality relationships, when observations are not collected frequently enough to capture the movements of economic variables (McCrorie and Chambers, 2006). Finally, as Nair-Reichert and Weinhold (2001) argue, there is a possibility that the (correct) expectation of future high growth rates has 'caused' the increased FDI.

Due to the problems of causality test and the contradiction in the analysis results in this Chapter and Chapter 4, it does not make sense to discuss the results and suggest policy implications. Therefore, we will change the research design and will re-estimate the determinants of FDI inflows and outflows and their relationship with economic growth in Chapter 6.

6 The determinants of inward and outward FDI and their relationship with economic growth revisited

6.1 Introduction

The causality test carried out in Chapter 4 divides the sample of 20 developed OECD countries into four groups – countries which have one-way causal relationship from FDI to growth, countries which have one-way causal relationship from growth to FDI, countries which have two-way causal relationship between FDI and growth and countries which do not have any causal relationship between the two variables. Chapter 5 examines the determinants of FDI inflows and outflows for each of the above country groups. However, the results in Chapters 4 and 5 are contradictory to each other due to the limitations of the research design and the problems of causality testing. Therefore, this chapter re-investigates the determinants of inward and outward FDI and their relationship with economic growth using all the 20 sample countries as a whole.

6.2 Model specification

Two stage least squares simultaneous equations model is used since both economic growth and FDI inflows/outflows can be endogenous variables (see Chapter 5.3.2.2) Economic growth might affect FDI inflows/outflows, so it can be one of the determinants of FDI inflows/outflows. On the other hand, economic growth is not necessarily an independent variable and may also be affected by FDI inflows/outflows such that there may be a reverse relationship from FDI inflows/outflows to economic growth. Therefore, economic growth can affect FDI inflows/outflows via equation (5.15) and FDI inflows/outflows can in turn affect economic growth via equation (5.16). Neglecting the interdependence between FDI inflows/outflows and economic growth may result in biased and inconsistent estimates. Hence, 2SLS simultaneous equations

model is required to account for the simultaneity between economic growth and FDI inflows/outflows.

We incorporate FDI inflows/outflows and economic growth regressions into equations (5.15) and (5.16) respectively:

$$Y_{it1} = \theta_1 + \alpha_1 Y_{it2} + \beta_1 X_{it1} + \beta_2 X_{it2} + ... + \beta_{k1} X_{itk1} + a_{i1} + v_{it1} \quad (5.15)$$

$$Y_{it2} = \theta_2 + \alpha_2 Y_{it1} + \gamma_1 W_{it1} + \gamma_2 W_{it2} + ... + \gamma_{k2} W_{itk2} + a_{i2} + v_{it2} \quad (5.16)$$

i: a country

t: a year

Y_1: the dependent variable in equation (5.15) which is FDI inflows/outflows as a percentage of GDP, it is endogenous in equation (5.16)

Y_2: the dependent variable in equation (5.16) which is economic growth rate, it is endogenous in equation (5.15)

a_i: time-invariant error

v_{it}: time-variant error

$X_1 \dots X_{k1}$: a vector of exogenous explanatory variables in equation (5.15) including past level of FDI stock, trade openness, unit labour cost, exchange rate, corporate tax revenue, trade union density, employment protection legislation, inflation rate and R&D expenditure.

$W_1 \dots W_{k2}$: a vector of exogenous explanatory variables in equation (5.16) including government consumption, domestic investment, trade openness, R&D expenditure and inflation rate.

6.3 Data

The annual data cover the period 1981-2008 with a sample of 20 developed OECD countries including Australia, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK and US.

6.4 Data analysis

6.4.1 Descriptive analysis

Appendix 9.6 reports the descriptive statistics, while Appendices 9.7 and 9.8 report the correlation matrix for the variables in FDI inflows and outflows equations respectively. The correlation matrix indicates a moderate level of correlation between one year lagged inward FDI stock and trade openness (r = 0.6329), between one year lagged outward FDI stock and trade openness (r = 0.5253), between government expenditure and domestic investment (r = -0.5178 or -0.5215). However, variance-inflation factor (VIF) tests do not show any problem of multicollinearity (all VIF tests are less than 3 as shown in Table 6.1 – Table 6.4).

6.4.2 FDI inflows model

We control the endogeneity of both economic growth and FDI inflows by employing 2SLS simultaneous equations model shown in Table 6.1 and Table 6.2. Model (1) includes all the variables, while Model (2) removes the insignificant variables found in Model (1). The endogeneity test in Table 6.1 rejects the null hypothesis confirming that economic growth is endogenous. Moreover, the Hansen test for over identification does not reject the null hypothesis suggesting the validity of our instruments.

The coefficient of economic growth is positive and significant in Table 6.1, suggesting it is one of the determinants of FDI inflows, which corresponds to the findings of

Billington (1999) and Lipsey (2000). Employment protection legislation index is marginally significant in Model (1) and significant at 5% level in Model (2), which means that strict employment legislation in the host country is a deterrent to inward FDI and it is consistent with the study of Radulescu and Robson (2008). Union density, R&D expenditure and inflation rate do not have significant effects on the amount of FDI the host country receives. For the other variables, the results agree with Lipsey (2000) and show strong support for the existence of the positive relationship between trade openness and FDI inflows indicating that open economy encourages FDI inflows and FDI inflows are complements of trade. In addition, the past level of inward FDI and corporate tax revenue are not statistically significant, which corresponds to the findings of Yang *et al.* (2000) and Radulescu and Robson (2008) respectively. Moreover, labour cost does not have a significant impact on FDI inflows and the result is consistent with Bajo-Rubio and Sosvilla-Riveoro (1994) and Billington (1999). Finally, we agree with Yang *et al.* (2000), Wijeweera and Clark (2006) and find that exchange rate is not a significant determinant of FDI inflows.

The results of the economic growth regression are reported in Table 6.2. The endogeneity test shows that FDI inflows is an exogenous variable. The Hansen test indicates that some of the instrumental variables are not valid and not exogenous. The results show that FDI inflows do not have a significant impact on economic growth, which corresponds to the findings of Blonigen and Wang (2005). In addition, domestic investment contributes to economic growth, while government consumption and inflation rate deter economic growth.

Table 6.1 FDI inflows model		
	Dependent variable: FDI inflows as a percentage of GDP	
Independent variables	(1)	(2)
Economic growth	0.349** (2.16)	0.381*** (2.79)
Inward FDI stock (-1)	0.001 (0.07)	
Trade openness	0.099*** (3.09)	0.113*** (4.36)
Unit labour cost	-0.051 (-1.04)	
Exchange rate	0.001 (0.16)	
Corporate tax revenue	0.039 (0.25)	
Union density	-0.009 (-0.27)	
Employment protection legislation	-0.748[a] (-1.39)	-1.013** (-2.03)
Inflation rate	0.074 (1.24)	
R&D expenditure	-0.195 (-0.27)	
Countries	20	20
Observations	457	538
VIF test	1.59	1.03
Hansen test (*p*-value)	2.349 (0.1253)	3.894 (0.1427)
Endogeneity test (*p*-value)	2.857* (0.0910)	4.788** (0.0287)
Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively. (4) [a]: significant at 16.5%.		

Table 6.2 Economic growth model		
	Dependent variable: Growth rate of GDP	
Independent variables	(1)	(2)
FDI inflows	0.374 (1.35)	0.024 (0.39)
Government consumption	-0.441*** (-3.64)	-0.549*** (-7.23)
Domestic investment	0.217*** (3.98)	0.201*** (4.78)
Trade openness	-0.037 (-1.07)	
R&D expenditure	-0.256 (-0.66)	
Inflation	-0.170***	-0.188***

	(-4.08)	(-5.99)
Countries	20	20
Observations	457	538
VIF test	1.34	1.27
Hansen test (*p*-value)	22.252*** (0.0005)	3.118* (0.0774)
Endogeneity test (*p*-value)	0.448 (0.5033)	0.820 (0.3653)
Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.		

6.4.3 FDI outflows model

The FDI outflows equation is shown in Table 6.3 and economic growth equation is shown in Table 6.4. All variables are included in Model (1), while only the significant variables are included in Model (2). In Table 6.3, the endogeneity test confirms that economic growth is endogenous and the Hansen test confirms that the instruments are valid. The analysis results in Table 6.3 show that higher economic growth in the home country encourages FDI outflows, which is consistent with the study of Lipsey (2000). Moreover, the degree of trade openness in the home country and FDI outflows are positively related, which corresponds to the findings of Lipsey (2000), Kyrkilis and Pantelidis (2003), Wang and Wong (2007). In addition, the results agree with Lipsey (2000) and find that current FDI outflows positively depend on the past level of outward FDI stock. Moreover, currency depreciation in the home country leads to more FDI abroad, as it might be viewed as a signal of future depreciation, which is consistent with the study of Kyrkilis and Pantelidis (2003). Furthermore, low labour cost in the home country encourages FDI outflows as low labour cost might reflect low skill level and low productivity. Among these significant variables, it is found that past level of outward FDI stock, economic growth and trade openness are the most important determinants, with the highest significance level. However, corporate tax revenue, union

density, employment protection legislation, inflation rate and R&D expenditure are not significant determinants of FDI outflows.

The results for economic growth equation are presented in Table 6.4. In Model (1) endogeneity test shows that FDI outflows is an exogenous variable and Hansen test shows that some instruments are not valid. Model (2) suggests the endogeneity of FDI outflows and the validity of the instruments. FDI outflows are negative and significant, which means that FDI outflows reduce the home country's economic growth. Moreover, domestic investment and trade openness are positively related with economic growth, while government consumption and inflation rate are negatively associated with economic growth.

Table 6.3 FDI outflows model

	Dependent variable: FDI outflows as a percentage of GDP	
Independent variables	(1)	(2)
Economic growth	0.410*** (3.90)	0.357*** (3.84)
Outward FDI stock (-1)	0.048*** (4.28)	0.049*** (5.15)
Trade openness	0.076*** (3.86)	0.094*** (5.15)
Unit labour cost	-0.067** (-2.02)	-0.044* (-1.93)
Exchange rate	0.014* (1.88)	0.016** (2.23)
Corporate tax revenue	0.206 (1.20)	
Union density	0.023 (0.72)	
Employment protection legislation	-0.396 (-1.02)	
Inflation	0.054 (0.94)	
R&D expenditure	-0.150 (-0.22)	
Countries	20	20
Observations	451	535
VIF test	1.47	1.31
Hansen test	0.099	1.579

(*p*-value)	(0.7529)	(0.4540)
Endogeneity test (*p*-value)	9.932*** (0.0016)	7.079*** (0.0078)
Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.		

Table 6.4 Economic growth model		
	Dependent variable: Growth rate of GDP	
Independent variables	(1)	(2)
FDI outflows	-0.109 (-1.05)	-0.392*** (-2.83)
Government consumption	-0.635*** (-6.76)	-0.716*** (-8.44)
Domestic investment	0.215*** (4.07)	0.196*** (4.44)
Trade openness	0.022 (1.15)	0.060*** (2.62)
R&D expenditure	-0.304 (-0.88)	
Inflation	-0.225*** (-5.20)	-0.253*** (-6.48)
Countries	20	20
Observations	451	535
VIF test	1.37	1.32
Hansen test (*p*-value)	28.439*** (0.0000)	2.167 (0.3384)
Endogeneity test (*p*-value)	2.282 (0.1309)	17.249*** (0.0000)
Notes: (1) All models are estimated with a constant. (2) Robust *z*-values are in parentheses. (3) *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.		

6.5 Conclusion

This Chapter has sought to examine the determinants of FDI inflows and outflows and their relationship with economic growth. We employ a panel data for 20 developed OECD countries over the period 1981-2008 and use 2SLS simultaneous equations econometric method. The results show that FDI inflows do not have a significant impact on economic growth as found in Blonigen and Wang (2005), but economic growth is a significant determinant of FDI inflows as found in Billington (1999) and Lipsey (2000). It finds evidence of a negative effect on FDI inflows from an index of the strictness of

employment protection legislation in line with findings from Radulescu and Robson (2008), which means that rigid employment protection legislation in the host country helps to deter inward FDI. Trade openness is found to be a strong explanatory variable for FDI inflows, indicating that open host economies encourage foreign firms to invest as it leads to a better business climate and the enhanced expectations of economic growth prospects.

However, labour cost is not an important factor in influencing FDI inflows, which is consistent with the findings of Bajo-Rubio and Sosvilla-Rivero (1994) and Billington (1999). Although high labour cost in developed countries should not be taken as a serious threat to FDI inflows since multinational firms in developed countries are more concerned with skilled labour force and are less concerned with labour cost. While multinational firms in developing countries might give more preference to cheap unskilled labour (Bajo-Rubio and Sosvilla-Rivero, 1994). Finally, the effects of union density, R&D expenditure, past level of inward FDI stock, corporate tax, exchange rate and inflation rate on FDI inflows are statistically insignificant.

In terms of FDI outflows, they have negative impacts on economic growth, while economic growth positively influences FDI outflows as found in Lipsey (2000). In addition, the results show evidence consistent with findings of previous studies that trade openness (Lipsey, 2000; Kyrkilis and Pantelidis, 2003; Wang and Wong, 2007) and past level of outward FDI stock (Lipsey, 2000) in the home country boost outward FDI. Moreover, currency depreciation in the home country encourages FDI outflows, which is the same as the results of Kyrkilis and Pantelidis (2003). Furthermore, low labour cost in the home country encourages FDI outflows as low labour cost might

indicate low labour productivity. Finally, union density, employment protection legislation, R&D expenditure, corporate tax and inflation rate are not important factors influencing FDI outflows.

7 Conclusion

This Chapter summarizes the major findings of the thesis, policy implications, study limitations and possible future research areas. The central research topics considered in this thesis are the determinants of inward and outward FDI and their relationship with economic growth in developed OECD countries. The central research topics are divided into three research questions. The first research question is to examine the determinants of inward FDI in the host country with respect to labour market flexibility. The second research question analyses the effect of labour market flexibility on outward FDI and other factors which influence outward FDI in the home country. The third research question investigates the two-way relationship between inward/outward FDI and economic growth.

Chapter 2 looks at the trends of FDI inflows/outflows in developed OECD countries and finds that the developed OECD countries encompass the significant proportion of global FDI inflows and outflows. Therefore, developed OECD countries are the major sources and recipients of global FDI. However, FDI distribution shows that individual OECD countries have different amounts of FDI inflows/outflows. Therefore, it is important to examine why different countries have different FDI inflows/outflows and what country factors affect inflows/outflows.

Chapter 3 reviews economic theory and empirical literature on the research questions. Current empirical studies on the determinants of inward FDI and the two-way relationship with economic growth concentrate on developing countries. In terms of the developed countries, empirical studies employ firm level data, industry level data, bilateral FDI data, with limited studies on aggregate inward FDI data from the rest of

the world. Moreover, there is a dearth of empirical literature on the determinants of outward FDI and the two-way link between outward FDI and home country's economic growth. In addition, current studies on the determinants of inward/outward FDI include economic growth as an important determinant, but do not take into account the reverse relationship from inward/outward FDI to economic growth. Furthermore, there is only one developed country study on the impact of labour market flexibility on inward FDI using aggregate FDI data and no empirical study on the effect of labour market flexibility on outward FDI. Finally, developed country studies on the two way relationship between FDI and economic growth do not explain why different countries experience different FDI-growth relationships. Therefore, this thesis complements current studies by focusing on developed OECD countries and aggregate inward/outward FDI data from/to the rest of the world. Moreover, it examines the determinants of inward/outward FDI with economic growth as an explanatory variable and takes into account of the feedback relationship from inward/outward FDI to economic growth. In addition, it analyses whether labour market flexibility has a significant impact on inward/outward FDI. Finally, it investigates the two-way relationship between inward/outward FDI and economic growth and looks at whether country-specific factors can explain the different FDI-growth relationships in different countries.

Therefore, Chapter 4 addresses the causal link between FDI inflows/outflows and economic growth for 20 developed OECD countries. There are four possible results for inflows-growth relationships – FDI-led growth, growth-led FDI, bi-directional causality and no causality. If the causality is unidirectional from inflows to economic growth, it would suggest FDI inflows contribute to economic growth in the host country and

approve FDI-led growth hypothesis. If the causal link runs in the opposite direction, it would imply that economic growth in the host country attracts FDI inflows and confirm growth-led FDI hypothesis. If the causal process is bi-directional, then inflows and growth would have a reinforcing causal relationship. Finally, no causality means that no relationship exists between the two variables. The causal links between outflows and economic growth are the same as discussed above. A time-series causality test is applied to 20 developed OECD counties over the period 1981-2008. The analysis results divide the sample of countries into 4 groups – countries that experience FDI-led growth, countries that experience growth-led FDI, countries that experience bi-directional causality and countries that do not experience any causality between the two variables.

Chapter 5 empirically tests the factors that attract FDI inflows and encourage FDI outflows using fixed/random effect model and 2SLS simultaneous equations model based upon causality test results in Chapter 4. Hence, the determinants of inflows and outflows are analysed for each of the country groups – countries that experience FDI-led growth, countries that experience growth-led FDI, countries that experience bi-directional causality and countries that do not experience causality. However, the results on the determinants of FDI inflows/outflows are contradictory with the causality test results in Chapter 4. For instance, economic growth in the host country is found to cause FDI inflows for a group of countries in Chapter 4, whilst the results in Chapter 5 indicate that economic growth is not a significant determinant of FDI inflows for the same group of countries. Therefore, the results in Chapters 4 and 5 are not consistent and it is not rational to discuss the determinants of FDI inflows/outflows based on causality test results.

Upon realising the limitations of the research design in Chapters 4 and 5 and the disadvantages of causality testing, then Chapter 6 re-investigates the determinants of FDI inflows and outflows and their relationship with economic growth for the whole sample countries using 2SLS simultaneous equations model between 1981 and 2008. The empirical findings suggest that FDI inflows do not contribute to economic growth in the host country and economic growth positively affects FDI inflows. In addition, trade openness and flexible employment protection legislation in the host country attract FDI inflows. Moreover, past level of inward FDI stock, labour cost, exchange rate, corporate tax, union density, inflation rate and R&D expenditure in the host country do not have significant impacts on FDI inflows.

In terms of FDI outflows, they reduce economic growth in the home country, while economic growth in the home country increases FDI outflows. Moreover, high past level of outward FDI stock, trade openness, low labour cost and currency depreciation in the home country provide incentives for domestic firms to invest abroad. Finally, the effects of corporate tax, union density, employment protection legislation, inflation rate and R&D expenditure are not significant.

The empirical results show that FDI inflows do not affect economic growth in developed host countries, which is consistent with the findings of Blonigen and Wang (2005). One explanation might be that M&As dominate FDI inflows in developed countries rather than greenfield investment projects that entail the establishment of new production facilities (Moran *et al.*, 2005). In contrast, cross-border M&As involve the partial or full takeover or the merging of capital, assets and liabilities of existing firms in a host country by foreign firms (UNCTAD, 2006). Hence, greenfield investment adds

to production capacity and contributes to employment generation in the host country, whilst cross border M&As may be less beneficial for economic development than greenfield investment in the short term since they transfer the ownership and control of local assets from domestic to foreign owners, do not add to productive capacity at the time of entry (UNCTAD, 2000). This may lead to layoffs of existing employees by the new owner to enhance efficiency and to reduce excess capacity (UNCTAD, 2000). Moreover, M&As can lead to a reduction of R&D in acquired firms in the host country if there is duplication of R&D or few complementarities between the acquired and acquiring firms, while greenfield investment does not directly reduce the technological assets and capabilities in the host country (UNCTAD, 2000). Although cross-border M&As are often followed by sequential investments by the foreign acquirers, however, an acquired firm in developed host countries may be highly efficient and does not need much sequential investments (UNCTAD, 2000).

Moran *et al.* (2005) argue that the insignificant effect might be also due to FDI measurement issues. The absolute magnitude of FDI inflows into developed countries is large, but FDI inflows as a percentage of GDP are smaller to developed countries than to developing countries. Therefore, the percentage data do not enable econometric filters to discern the effect of FDI inflows on growth (Moran *et al.*, 2005). However, the problem of using absolute FDI inflows data is that an appropriate investment deflator is not available to change nominal values into real values.

Returning to the original finding that FDI outflows negatively influence economic growth in the home developed countries, possible reasons are that FDI outflows replace domestic investment and reduce domestic employment in the home country. If the

repatriated profits from FDI outflows are invested domestically, it would increase capital spending, boot economic growth and create new jobs in the home country. However, there is strong evidence that the repatriated profits were not used on domestic investment in US. Instead, they were used to purchase stock, to increase the reinvested earnings abroad, to pay dividends to corporate owners and shareholders in US (Marr and Highsmith, 2011). For example, Cisco has increased the amount of profits that are permanently reinvested overseas by $24.8 billion since 2004 and announced an additional $10 billion stock purchase programme on top of a previously-announced $72 billion in November 2010, Pfizer announced a new $5 billion share purchase programme in February 2011, Microsoft announced a 23 percent increase in its quarterly dividend in September 2010, Adobe Systems announced a plan to purchase $1.6 billion in stock in June 2010, Qualcomm announced a $3 billion stock purchase program and a 12 percent increase in its quarterly dividend in March 2010, CA, Inc announced a $0.5 billion new stock purchase programme in May 2010 (Marr and Highsmith, 2011).

In addition, there is evidence that repatriated profits do not create jobs in the home country. Hewlett-Packard repatriated around $14.5 billion and laid off 14,500 domestic workers in the first half of 2005, Pfizer repatriated around $37 billion and eliminated around 10,000 domestic jobs in 2005, Ford Motors repatriated around $850 million and laid off more than 30,000 domestic workers in 2005 and 2006, Merck repatriated $15.9 billion and laid off 7,000 domestic workers in 2005, Honeywell International repatriated $2.7 billion and laid off 2,000 domestic workers in 2005 and 2006 (Marr and Highsmith, 2011). Therefore, it would appear that FDI outflows shift investment and jobs overseas and reduce economic growth in the home country.

Therefore, since the analysis results do not find a positive impact of FDI inflows on economic growth in the host country, this would suggest that developed countries should reconsider the incentives to attract FDI inflows. Such encouragement to foreign firms to invest in a host country include fiscal incentives (import duty exemptions, tax holidays, tax reduction, investment and reinvestment allowances), financial incentives (government subsidies and loans at concessionary rates) and other incentives (preferential government contracts, closing the market for further entry, granting of monopoly rights, protection from import competition, preferential treatment for foreign exchange, infrastructure subsidy and service subsidy) (UNCTAD, 1998; UNCTAD, 2004). However, the number of countries promoting investment incentives and the range of possible incentives have increased (UNCTAD, 2003; UNCTAD, 2004). Especially, there has been an expansion of incentive packages that developed countries have adopted to attract foreign investors (Moran *et al.*, 2005). For example, Ireland offered special incentive packages to more than 1200 foreign firms between 1980 and 2000. Moreover, fiscal incentives are the most widely used and they have increased in the developed countries between the mid-1980s and the early 1990s (UNCTAD, 1995). In addition, financial incentives are more frequently used in developed countries as they can afford the upfront subsidies for FDI inflows (UNCTAD, 2003; UNCTAD, 2004). Hence, the subsidy per FDI-related job is very high, for example, financial subsidy per job created is $50,588 for Fuji-Isuzu's investment in Lafayette, US in 1986, $254,451 for Auto Europa, Ford and Volkswagen investing in Setubal, Portugal in 1991, $166,667 for Mercedes-Benz's investment in Tuscaloosa, US in 1993 and $128, 720 for Jaguar's investment in Castle Bromwich, UK in 1995 (UNCTAD, 1995).

In addition, since the analysis results show that FDI outflows negatively affect economic growth in the home country, this would suggest that developed countries should reconsider the promotional policies to encourage FDI outflows. Promotional policies for FDI outflows include information and technical assistance (information on financing, legal framework and administrative process), direct financial support and fiscal incentives (government subsidies, preferential loans to domestic firms, government equity participation, tax holidays, tax reduction) and investment insurance (UNCTAD, 1995). Japan is the most active developed country promoter of FDI outflows. The Export-Import Bank of Japan offered overseas investment loans in 1957 and supported 143 Japanese corporations over the next decade, which represents about 20% of the value of Japanese FDI in manufacturing and non-mineral/energy resource industries. In addition, the bank devoted nearly 40% of its financing to overseas loans in 1992 and 1993 (UNCTAD, 1995).

Hence, in terms of policy implications, this study agrees with Carkovic and Levine (2005), which does not support offering special incentives to foreign investors in order to attract FDI inflows. In addition, this study does not support promotional policies to encourage FDI outflows. Instead, government should provide incentives for domestic investment and other sound policies to increase economic growth, which in itself provides a good environment to attract FDI inflows and to encourage FDI outflows.

Finally, this thesis has its own limitations. First, the empirical analysis uses 2SLS simultaneous equations model to control for the potential endogeneity of FDI inflows/outflows and economic growth, but does not control for the potential endogeniety of other variables. Another limitation is that this study does not distinguish

between FDI data in the primary, manufacturing and service sector or in different industries within a sector. We would expect that the determinants of FDI and FDI-growth relationship vary according to different sectors and industries. For example, the effect of FDI in manufacturing/service sector on economic growth might be greater than the effect of FDI in primary sector. However, good quality data on sectoral or industry level FDI is not available, which prevents us from evaluating FDI in different sectors or industries. Hence, future research should focus on the determinants of FDI and FDI-growth relationship on sectoral/industry level. In addition, future research should investigate whether inward FDI increases or reduces the productivity of domestic firms in the host country. Lipsey and Sjoholm (2005) argue that the spillover effect from foreign firms to domestic firms could be either positive or negative. It could be positive as foreign firms might possess superior technology and could produce high-quality goods and services at lower prices (Lipsey and Sjoholm, 2005). Hence, the productivity of local firms can be improved by imitating the more advanced technology brought by foreign firms or by the increased competition with foreign firms (Blomstrom and Kokko, 1997; Ozturk, 2007). However, the spillover effect could be negative if foreign firms out-compete local firms and drive local firms out of business, which might lead to foreign firms taking the majority of market shares or establishing monopolies (Blomstrom and Kokko, 1997; Lipsey and Sjoholm, 2005; Hill, 2009). Therefore, it would be interesting to examine whether the effect of inward FDI on the productivity of local firms is positive or negative in future research.

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9 Appendices

Appendix 9.1 Details of unit root tests

DF-GLS and ADF unit root tests on level series				
	DF-GLS test		ADF test	
	k	ERS Test Statistic	*k*	Test Statistic (p-value)
Australia (1981-2008)				
FDI inflows (constant)	1	-3.861***	1	-3.663*** (0.0047)
FDI outflows (constant)	1	-3.967***	1	-4.029*** (0.0013)
GDP growth (constant)	3	-2.022**	3	-2.088 (0.2494)
Austria (1981-2008)				
FDI inflows (constant and trend)	1	-2.371	1	-2.662 (0.2524)
FDI outflows (constant and trend)	4	-0.807	4	3.482 (1.000)
GDP growth (constant)	1	-2.053**	1	-3.435*** (0.0098)
Canada (1981-2008)				
FDI inflows (constant and trend)	1	-3.017*	1	-3.094[a] (0.1076)
FDI outflows (constant and trend)	1	-2.001	1	-2.264 (0.4541)
GDP growth (constant)	1	-3.185***	1	-4.367*** (0.0003)
Denmark (1981-2008)				
FDI inflows (constant and trend)	1	-2.713	1	-2.751 (0.2154)
FDI outflows (constant and trend)	1	-3.105*	1	-3.176* (0.0893)
GDP growth (constant)	1	-2.575**	1	-2.711* (0.0722)
Finland (1981-2008)				
FDI inflows (constant and trend)	1	-1.913	1	-1.852 (0.6792)
FDI outflows (constant and trend)	1	-1.789	1	-1.802 (0.7040)
GDP growth (constant)	1	-3.127***	1	-3.278** (0.0159)
France (1981-2008)				
FDI inflows (constant and trend)	1	-2.726	1	-2.872 (0.1716)
FDI outflows (constant and trend)	1	-3.626**	1	-3.724** (0.0208)
GDP growth (constant)	1	-2.370**	1	-2.696* (0.0748)
Germany (1981-2008)				
FDI inflows (constant and trend)	1	-2.818	1	-2.891 (0.1651)
FDI outflows (constant and trend)	1	-4.198***	1	-4.387*** (0.0023)
GDP growth (constant)	1	-2.589**	1	-3.446*** (0.0095)
Ireland (1981-2008)				
FDI inflows (constant and trend)	2	-1.729	2	-1.572 (0.8033)
FDI outflows (constant and trend)	2	-1.438	2	-1.977 (0.6141)
GDP growth (constant)	1	-1.429	1	-1.631 (0.4667)
Italy (1981-2008)				
FDI inflows (constant and trend)	4	-1.171	4	-1.283 (0.8922)
FDI outflows (constant and trend)	1	-2.106	1	-1.907 (0.6511)
GDP growth (constant)	2	-1.699*	2	-1.897 (0.3335)
Japan (1981-2008)				
FDI inflows (constant and trend)	2	-2.301	2	-2.579 (0.2897)
FDI outflows (constant and trend)	2	-1.436	2	-0.768 (0.9683)
GDP growth (constant)	2	-1.353	2	-1.164 (0.6889)
Korea (1981-2008)				
FDI inflows (constant and trend)	3	-1.577	3	-1.340 (0.8776)

FDI outflows (constant and trend)	1	-2.407	1	-2.171 (0.5060)
GDP growth (constant)	4	-1.009	4	-0.800 (0.8193)
Netherlands (1981-2008)				
FDI inflows (constant and trend)	1	-1.910	1	-1.993 (0.6051)
FDI outflows (constant and trend)	4	-1.270	4	-1.042 (0.9382)
GDP growth (constant)	4	-1.014	4	-2.425 (0.1349)
New Zealand (1981-2008)				
FDI inflows (constant)	3	-1.213	3	-2.634* (0.0862)
FDI outflows (constant)	4	-1.257	4	-1.209 (0.6697)
GDP growth (constant)	1	-2.171**	1	-2.274 (0.1806)
Norway (1981-2008)				
FDI inflows (constant and trend)	2	-2.044	2	-1.999 (0.6021)
FDI outflows (constant and trend)	2	-2.361	2	-2.235 (0.4703)
GDP growth (constant)	1	-3.038***	1	-3.672*** (0.0045)
Portugal (1981-2008)				
FDI inflows (constant and trend)	2	-2.037	2	-2.016 (0.5929)
FDI outflows (constant and trend)	2	-1.420	2	-1.365 (0.8708)
GDP growth (constant)	1	-2.340**	1	-2.634* (0.0861)
Spain (1981-2008)				
FDI inflows (constant and trend)	1	-2.333	1	-2.373 (0.3940)
FDI outflows (constant and trend)	1	-2.798	1	-3.004 (0.1309)
GDP growth (constant)	1	-1.989**	1	-2.703* (0.0736)
Sweden (1981-2008)				
FDI inflows (constant and trend)	1	-2.738	1	-2.806 (0.1948)
FDI outflows (constant and trend)	1	-2.904*	1	-2.968 (0.1412)
GDP growth (constant)	1	-2.309**	1	-2.969** (0.0379)
Switzerland (1983-2008)				
FDI inflows (constant and trend)	2	-1.844	2	-1.767 (0.7206)
FDI outflows (constant and trend)	1	-4.456***	1	-4.488*** (0.0016)
GDP growth (constant)	1	-2.809***	1	-3.277** (0.0159)
UK (1981-2008)				
FDI inflows (constant and trend)	1	-3.404**	1	-3.462** (0.0436)
FDI outflows (constant and trend)	1	-3.108*	1	-3.173* (0.0900)
GDP growth (constant)	3	-1.497	3	-2.830* (0.0541)
US (1981-2008)				
FDI inflows (constant and trend)	1	-3.312**	1	-3.321* (0.0628)
FDI outflows (constant and trend)	4	-1.807	4	-1.797 (0.7064)
GDP growth (constant)	3	-1.695*	3	-1.782 (0.3895)

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) The optimum lag length (*k*) is selected by the minimum AIC. Hsiao and Hsiao (2006) choose maximum lags as 3 for a sample of 19 observations. We choose the maximum lags as 4 for all countries as the number of observation is 28. (3) ***, **, * denote rejection of null hypothesis at the 1%, 5% and 10% level of significance respectively. (4) [a]: marginally significant at 10% level.

DF-GLS and ADF unit root tests on first-difference series				
	DF-GLS test		ADF test	
	k	ERS Test Statistic	*k*	Test Statistic (p-value)
Australia (1981-2008)				
First difference of FDI inflows				
First difference of FDI outflows				
First difference of GDP growth	1	-4.724***	1	-6.220*** (0.0000)
Austria (1981-2008)				
First difference of FDI inflows	3	-0.947	3	-4.132*** (0.0009)
First difference of FDI outflows	2	-2.346**	2	-3.429*** (0.0100)
First difference of GDP growth				
Canada (1981-2008)				
First difference of FDI inflows	1	-3.033***	1	-3.473*** (0.0087)
First difference of FDI outflows	3	-1.027	3	-1.498 (0.5343)
First difference of GDP growth				
Denmark (1981-2008)				
First difference of FDI inflows	1	-3.886***	1	-4.094*** (0.0010)
First difference of FDI outflows				
First difference of GDP growth				
Finland (1981-2008)				
First difference of FDI inflows	4	-1.264	4	-1.687 (0.4380)
First difference of FDI outflows	1	-3.254***	1	-3.415** (0.0105)
First difference of GDP growth				
France (1981-2008)				
First difference of FDI inflows	3	-1.657*	3	-2.863** (0.0498)
First difference of FDI outflows				
First difference of GDP growth				
Germany (1981-2008)				
First difference of FDI inflows	1	-4.674***	1	-4.942*** (0.0000)
First difference of FDI outflows				
First difference of GDP growth				
Ireland (1981-2008)				
First difference of FDI inflows	3	-1.919*	3	-2.046 (0.2667)
First difference of FDI outflows	4	-1.906*	4	-2.229 (0.1958)
First difference of GDP growth	4	-1.232	4	-1.809 (0.3760)
Italy (1981-2008)				
First difference of FDI inflows	4	-1.090	4	-2.653* (0.0825)
First difference of FDI outflows	4	-0.113	4	-2.625* (0.0879)
First difference of GDP growth	2	-2.965***	2	-3.228** (0.0184)
Japan (1981-2008)				
First difference of FDI inflows	1	-4.185***	1	-4.366*** (0.0003)
First difference of FDI outflows	1	-2.011**	1	-1.954 (0.3070)
First difference of GDP growth	2	-2.481**	2	-3.175** (0.0215)
Korea (1981-2008)				
First difference of FDI inflows	1	-4.424***	1	-4.607*** (0.0001)
First difference of FDI outflows	3	-1.619*	3	-1.752 (0.4043)
First difference of GDP growth	1	-5.703***	1	-6.272*** (0.0000)
Netherlands (1981-2008)				
First difference of FDI inflows	1	-1.929*	1	-2.595* (0.0940)
First difference of FDI outflows	1	-4.314***	1	-4.570*** (0.0001)

First difference of GDP growth	1	-3.407***	1	-4.139*** (0.0008)
New Zealand (1981-2008)				
First difference of FDI inflows	1	-5.921***		
First difference of FDI outflows	1	-6.449***	1	-6.628*** (0.0000)
First difference of GDP growth	2	-2.584**	2	-2.796* (0.0589)
Norway (1981-2008)				
First difference of FDI inflows	2	-3.011***	2	-3.239** (0.0179)
First difference of FDI outflows	2	-2.949***	2	-3.183** (0.0210)
First difference of GDP growth				
Portugal (1981-2008)				
First difference of FDI inflows	2	-2.655**	2	-2.728* (0.0694)
First difference of FDI outflows	2	-2.525**	2	-2.733* (0.0685)
First difference of GDP growth				
Spain (1981-2008)				
First difference of FDI inflows	1	-2.372**	1	-2.488 (0.1184)
First difference of FDI outflows	1	-3.510***	1	-4.053*** (0.0012)
First difference of GDP growth				
Sweden (1981-2008)				
First difference of FDI inflows	1	-4.083***	1	-4.283*** (0.0005)
First difference of FDI outflows	1	-4.352***	1	-4.564*** (0.0002)
First difference of GDP growth				
Switzerland (1983-2008)				
First difference of FDI inflows	2	-0.730	2	-1.276 (0.6400)
First difference of FDI outflows				
First difference of GDP growth				
UK (1981-2008)				
First difference of FDI inflows				
First difference of FDI outflows				
First difference of GDP growth	4	-0.743		
US (1981-2008)				
First difference of FDI inflows				
First difference of FDI outflows	4	-0.500	4	-2.036 (0.2711)
First difference of GDP growth	4	-1.033	4	-2.396 (0.1430)

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) The test equations include only constant. (3) The optimum lag length (*k*) is selected by the minimum AIC. We choose the maximum lags as 4 for all countries. (4) ***, **, * denote rejection of null hypothesis at the 1%, 5% and 10% level of significance respectively.

DF-GLS and ADF unit root tests on second-difference series				
	DF-GLS test		ADF test	
	k ERS Test Statistic		*k* Test Statistic (p-value)	
Australia (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows				
Second difference of GDP growth				
Austria (1981-2008)				
Second difference of FDI inflows	4	1.104		
Second difference of FDI outflows				
Second difference of GDP growth				
Canada (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows	4	-0.845	4	-1.697 (0.4324)
Second difference of GDP growth				
Denmark (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows				
Second difference of GDP growth				
Finland (1981-2006)				
Second difference of FDI inflows	4	-1.387	4	-2.682* (0.0772)
Second difference of FDI outflows				
Second difference of GDP growth				
France (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows				
Second difference of GDP growth				
Germany (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows				
Second difference of GDP growth				
Ireland (1981-2008)				
Second difference of FDI inflows	4	-0.483	4	-1.642 (0.4611)
Second difference of FDI outflows	1	-8.050***	1	-8.746*** (0.0000)
Second difference of GDP growth	2	-1.785*	2	-2.711* (0.0722)
Italy (1981-2008)				
Second difference of FDI inflows	1	-4.720***		
Second difference of FDI outflows	4	-0.954		
Second difference of GDP growth				
Japan (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows	3	-1.748*	3	-1.721 (0.4201)
Second difference of GDP growth				
Korea (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows	4	-1.279	4	-2.211 (0.2024)
Second difference of GDP growth				
Netherlands (1981-2008)				
Second difference of FDI inflows				
Second difference of FDI outflows				

Second difference of GDP growth				
New Zealand (1981-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth				
Norway (1981-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth				
Portugal (1981-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth				
Spain (1981-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth	2	-2.241**	2	-2.542[a] (0.1055)
Sweden (1981-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth				
Switzerland (1983-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth	2	-2.464**	2	-2.810* (0.0569)
UK (1981-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth	4	-1.441		
US (1981-2008) Second difference of FDI inflows Second difference of FDI outflows Second difference of GDP growth	1 4	-8.206*** -0.183	1 4	-8.640*** (0.0000) -3.528*** (0.0073)

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) The test equations include only constant. (3) The optimum lag length (*k*) is selected by the minimum AIC, we choose the maximum lags as 4 for all countries. (4) ***, **, * denote rejection of null hypothesis at the 1%, 5% and 10% level of significance respectively. (5) [a]: marginally significant at 10% level.

Appendix 9.2 Details of diagnostic tests

Summary of diagnostic tests					
Country	Optimum lag *k*	Maximum order of integration *d*	Normality tests	LM test	Stability test
Australia	4	1	√	√[a]	X
	1	1	X	√	√
Austria	4	1	X	X	X
Canada	4	1	X	√	X
	1	1	X	X	√
Denmark	4	1	√	X	X
Finland	4	2	X	X[a]	X
	4	1	√	√	X
France	4	1	√	√	X
Germany	4	1	√	√	X
	2	1	X	√[a]	√
	1	1	X	√[a]	√
Ireland	4	2	X	X[a]	X
Italy	4	2	√	X[a]	X
	4	1	√	√[a]	X
	1	1	X	√	√
Japan	4	1	√	X	X
	1	1	X	√[a]	√
Korea	2	1	√[a]	√	√
	1	1	X	√	√
Netherlands	4	1	X	√	X
	2	1	X	X	√
New Zealand	4	1	√	X	√
Norway	3	1	√	√	X
Portugal	3	1	√	√	√
Spain	4	2	X	X[a]	X
	4	1	X	X	X
	1	1	X	X	√
Sweden	4	1	√	X	√
	1	1	X	√[a]	√
Switzerland	4	2	X	X[a]	X
UK	3	1	X	X	X
	1	1	X	√	√
US	4	2	√[a]	X[a]	X

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) Normality tests include skewness statistic, kurtosis statistic and the Jarque-Bera statistic tests for normally distributed disturbances after VAR. The null hypothesis is that the errors are normally distributed after VAR at 10% level. √ means that the null hypothesis is accepted at 10% level. √[a] means the null hypothesis is accepted at 5% level, but rejected at 10% level. X means the null hypothesis is rejected at both 5% level and 10% level. (3) In Lagrange-multiplier (LM) test for residual autocorrelation after VAR, the null hypothesis is that the residual is not auto-correlated after VAR at 10% level. √ means that the null hypothesis is accepted at 10% level until lag 4, √[a] means the null hypothesis is accepted at 5% level, but rejected at 10% level until lag 4. X means the null hypothesis is rejected at both 5% and 10% level until lag 4. X[a]: the exogenous variables may not be collinear with the dependent variables or their lags. (4) In stability test, √ means that the VAR model satisfies stability condition and X means that the VAR model does not satisfy stability condition.

Chi-square probability for Normality tests in Canada			
Equation	Jarque-Bera test	Skewness test	Kurtosis test
Canada (*k*=4, *d*=1)			
FDI inflows	0.00038	0.00562	0.00441
FDI outflows	0.52763	0.26008	0.91881
GDP growth	0.92113	0.76048	0.78936
All	0.00852	0.02891	0.04227
Canada (*k*=1, *d*=1)			
FDI inflows	0.00260	0.02651	0.00825
FDI outflows	0.01832	0.01274	0.18086
GDP growth	0.82024	0.66357	0.64906
All	0.00245	0.01013	0.02955
Notes: (1) The numbers are chi square probabilities. (2) The null hypothesis is that the errors are normally distributed after VAR. (3) The null hypothesis is rejected at 1% level in both cases. However, 4 numbers are less than 1% in the case (*k*=4, *d*=1) and 3 numbers are less than 1% in the case (*k*=1, *d*=1). Therefore, the case (*k*=1, *d*=1) is better than the case (*k*=4, *d*=1).			

Chi-square probability for Normality tests in Netherlands			
Equation	Jarque-Bera test	Skewness test	Kurtosis test
Netherlands (*k*=4, *d*=1)			
FDI inflows	0.00526	0.15550	0.00359
FDI outflows	0.29895	0.38477	0.19766
GDP growth	0.82680	0.60773	0.73245
All	0.03863	0.38605	0.01651
Netherlands (*k*=2, *d*=1)			
FDI inflows	0.98694	0.92607	0.89422
FDI outflows	0.00000	0.00041	0.00001
GDP growth	0.81676	0.90062	0.53271
All	0.00001	0.00579	0.00010
Notes: (1) The numbers are chi square probabilities. (2) The null hypothesis is that the errors are normally distributed after VAR. (3) The null hypothesis is rejected at 1% level in both cases. However, 2 numbers are less than 1% in the case (*k*=4, *d*=1) and 6 numbers are less than 1% in the case (*k*=2, *d*=1). Therefore, the case (*k*=4, *d*=1) is better than the case (*k*=2, *d*=1).			

Chi-square probability for Normality tests (chosen combination)			
Equation	Jarque-Bera test	Skewness test	Kurtosis test
Australia (*k*=1, *d*=1)			
FDI inflows	0.07490	0.86182	0.02321
FDI outflows	0.63056	0.49950	0.49469
GDP growth	0.00000	0.00013	0.00000
All	0.00000	0.00177	0.00001
Austria (*k*=4, *d*=1)			
FDI inflows	0.81924	0.70487	0.61337
FDI outflows	0.41186	0.25453	0.49030
GDP growth	0.01096	0.04956	0.02298
All	0.08241	0.15123	0.11651
Canada (*k*=1, *d*=1)			
FDI inflows	0.00260	0.02651	0.00825
FDI outflows	0.01832	0.01274	0.18086
GDP growth	0.82024	0.66357	0.64906
All	0.00245	0.01013	0.02955
Denmark (*k*=4, *d*=1)			
FDI inflows	0.15261	0.21016	0.13896
FDI outflows	0.53616	0.26528	0.94009
GDP growth	0.66873	0.37126	0.94199
All	0.44468	0.30668	0.53188
Finland (*k*=4, *d*=1)			
FDI inflows	0.13824	0.13913	0.18339
FDI outflows	0.63800	0.48598	0.52024
GDP growth	0.66071	0.47572	0.57148
All	0.45936	0.36446	0.47464
France (*k*=4, *d*=1)			
FDI inflows	0.43073	0.20479	0.78182
FDI outflows	0.76078	0.53641	0.68498
GDP growth	0.10316	0.15350	0.11343
All	0.34223	0.25854	0.43230
Germany (*k*=4, *d*=1)			
FDI inflows	0.97920	0.92838	0.85380
FDI outflows	0.98922	0.91412	0.92013
GDP growth	0.89038	0.62998	0.99095
All	0.99952	0.96882	0.99757
Ireland (*k*=4, *d*=2)			
FDI inflows	0.05729	0.34110	0.02824
FDI outflows	0.02939	0.04444	0.08254
GDP growth	0.62158	0.62321	0.39958
All	0.03287	0.15857	0.03613
Italy (*k*=1, *d*=1)			
FDI inflows	0.00190	0.01187	0.01277
FDI outflows	0.58818	0.31327	0.83277
GDP growth	0.03473	0.02197	0.22504
All	0.00244	0.00560	0.05224
Japan (*k*=1, *d*=1)			
FDI inflows	0.17619	0.81318	0.06455
FDI outflows	0.03571	0.03686	0.12872

GDP growth	0.98805	0.98767	0.87738
All	0.11802	0.22017	0.12453
Korea (*k*=2, *d*=1)			
FDI inflows	0.06006	0.06698	0.13194
FDI outflows	0.81970	0.94695	0.53062
GDP growth	0.15465	0.08095	0.40705
All	0.13532	0.09346	0.34073
Netherlands (*k*=4, *d*=1)			
FDI inflows	0.00526	0.15550	0.00359
FDI outflows	0.29895	0.38477	0.19766
GDP growth	0.82680	0.60773	0.73245
All	0.03863	0.38605	0.01651
New Zealand (*k*=4, *d*=1)			
FDI inflows	0.71386	0.42406	0.85135
FDI outflows	0.37179	0.44955	0.23554
GDP growth	0.52603	0.29267	0.67352
All	0.68509	0.50906	0.65493
Norway (*k*=3, *d*=1)			
FDI inflows	0.18487	0.13997	0.27375
FDI outflows	0.70572	0.77586	0.43254
GDP growth	0.40093	0.31744	0.36272
All	0.43435	0.35341	0.45012
Portugal (*k*=3, *d*=1)			
FDI inflows	0.43224	0.19564	0.95696
FDI outflows	0.87144	0.80034	0.64578
GDP growth	0.62690	0.33619	0.92418
All	0.82293	0.44647	0.97375
Spain (*k*=1, *d*=1)			
FDI inflows	0.00036	0.05492	0.00048
FDI outflows	0.26180	0.16094	0.39780
GDP growth	0.66173	0.99480	0.36350
All	0.00356	0.12994	0.00329
Sweden (*k*=4, *d*=1)			
FDI inflows	0.48960	0.23427	0.90711
FDI outflows	0.73568	0.48712	0.71735
GDP growth	0.52693	0.25868	0.94032
All	0.76726	0.36566	0.98519
Switzerland (*k*=4, *d*=2) FDI inflows FDI outflows GDP growth All	Matrix not positive definite	Matrix not positive definite	Matrix not positive definite
UK (*k*=1, *d*=1)			
FDI inflows	0.01158	0.02279	0.05339
FDI outflows	0.00308	0.53084	0.00083
GDP growth	0.18243	0.10164	0.39512
All	0.00055	0.04099	0.00135
US (*k*=4, *d*=2)			
FDI inflows	0.83265	0.85055	0.56520
FDI outflows	0.94271	0.75464	0.88661

GDP growth	0.15268	0.06813	0.51135
All	0.64381	0.32589	0.85367

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) The null hypothesis is that the errors are normally distributed after VAR.

Chi-square probability for LM test (chosen combination)		
Country	Lag	Chi-square probability
Australia	1	0.12149
(*k*=1, *d*=1)	2	0.65991
	3	0.33560
	4	0.40998
Austria	1	0.01806
(*k*=4, *d*=1)	2	0.23631
	3	0.17946
	4	0.08386
Canada	1	0.05025
(*k*=1, *d*=1)	2	0.01238
	3	0.51405
	4	0.30173
Denmark	1	0.09001
(*k*=4, *d*=1)	2	0.00727
	3	0.13751
	4	0.05567
Finland	1	0.85969
(*k*=4, *d*=1)	2	0.67196
	3	0.41942
	4	0.71380
France	1	0.64538
(*k*=4, *d*=1)	2	0.19350
	3	0.79098
	4	0.52730
Germany	1	0.87684
(*k*=4, *d*=1)	2	0.59068
	3	0.41963
	4	0.95970
Ireland		The exogenous variables may not be collinear with
(*k*=4, *d*=2)		the dependent variables or their lags.
Italy	1	0.95747
(*k*=1, *d*=1)	2	0.38937
	3	0.67410
	4	0.82647
Japan	1	0.35325
(*k*=1, *d*=1)	2	0.34090
	3	0.05231
	4	0.54139
Korea	1	0.56449
(*k*=2, *d*=1)	2	0.83095

	3	0.89198
	4	0.93515
Netherlands	1	0.19288
(*k*=4, *d*=1)	2	0.96405
	3	0.46008
	4	0.48917
New Zealand	1	0.08483
(*k*=4, *d*=1)	2	0.71476
	3	0.03058
	4	0.68634
Norway	1	0.68867
(*k*=3, *d*=1)	2	0.35124
	3	0.92078
	4	0.98221
Portugal	1	0.88552
(*k*=3, *d*=1)	2	0.21199
	3	0.23853
	4	0.40055
Spain	1	0.09034
(*k*=1, *d*=1)	2	0.24963
	3	0.07484
	4	0.01037
Sweden	1	0.36177
(*k*=4, *d*=1)	2	0.04644
	3	0.00034
	4	0.00567
Switzerland		The exogenous variables may not be collinear with
(*k*=4, *d*=2)		the dependent variables or their lags.
UK	1	0.51426
(*k*=1, *d*=1)	2	0.46786
	3	0.18060
	4	0.92899
US		The exogenous variables may not be collinear with
(*k*=4, *d*=2)		the dependent variables or their lags.

Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) The null hypothesis is that the residual is not auto-correlated after VAR.

Eigenvalue stability condition test (chosen combination)	
Country	Eigenvalue condition
Australia (k=1, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Austria (k=4, d=1)	9 eigenvalues are more than 1. VAR model does not satisfy stability condition.
Canada (k=1, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Denmark (k=4, d=1)	10 eigenvalues are more than 1. VAR model does not satisfy stability condition.
Finland (k=4, d=1)	6 eigenvalues are more than 1. VAR model does not satisfy stability condition.
France (k=4, d=1)	6 eigenvalues are more than 1. VAR model does not satisfy stability condition.
Germany (k=4, d=1)	2 eigenvalues are more than 1. VAR model does not satisfy stability condition.
Ireland (k=4, d=2)	14 eigenvalues are more than 1. VAR model does not satisfy stability condition.
Italy (k=1, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Japan (k=1, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Korea (k=2, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Netherlands (k=4, d=1)	8 eigenvalues are more than 1. VAR model does not satisfy stability condition.
New Zealand (k=4, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Norway (k=3, d=1)	1 eigenvalue is more than 1. VAR model does not satisfy stability condition.
Portugal (k=3, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Spain (k=1, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Sweden (k=4, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
Switzerland (k=4, d=2)	9 eigenvalues are more than 1. VAR model does not satisfy stability condition.
UK (k=1, d=1)	All the eigenvalues lie inside the unit circle. VAR model satisfies stability condition.
US (k=4, d=2)	8 eigenvalues are more than 1. VAR model does not satisfy stability condition.
Notes: (1) Data in Germany refer to former federal republic of Germany (West Germany) before 1990, data refer to former federal republic of Germany (West Germany) and former democratic republic of Germany (East Germany) from 1990. (2) If all the eigenvalues lie inside the unit circle, VAR model satisfies stability condition. If at least one eigenvalue is equal or more than 1, VAR model does not satisfy stability condition.	

Appendix 9.3 FDI-growth relationship and country specific factors							
Country	Inflows-growth relationship	Outflows-growth relationship	Financial development	GDP per capita	Trade openness	Domestic investment	R&D expenditure
Australia	FDI → growth	FDI → growth	70.14	19276	35.75	24.72	1.38
Austria	FDI ↔ growth	FDI ↔ growth	94.29	21033	80.87	23.71	1.70
Canada	No causality	No causality	110.68	21034	64.48	20.65	1.68
Denmark	FDI ↔ growth	FDI ↔ growth	81.56	26526	78.19	20.05	1.83
Finland	FDI ↔ growth	FDI ↔ growth	67.29	20900	64.52	22.41	2.49
France	FDI ↔ growth	FDI → growth	90.88	19674	47.85	20.06	2.17
Germany	No causality	FDI ← growth	98.62	20619	57.63	20.88	2.46
Ireland	FDI ↔ growth	FDI ↔ growth	84.38	19068	133.93	21.35	1.04
Italy	No causality	No causality	65.56	17154	45.66	21.29	1.08
Japan	FDI ← growth	No causality	184.09	33619	22.35	27.47	2.94
Korea	FDI ← growth	FDI ← growth	65.08	9048	68.09	31.96	2.44
Netherlands	FDI ↔ growth	FDI ↔ growth	111.45	20815	117.75	21.21	1.91
New Zealand	FDI ↔ growth	FDI → growth	82.18	12551	58.12	22.60	1.03
Norway	FDI ↔ growth	FDI → growth	56.82	32318	72.90	23.27	1.55
Portugal	FDI ↔ growth	FDI ← growth	90.38	9461	63.36	26.04	0.63
Spain	No causality	No causality	96.18	12389	46.44	24.50	0.82
Sweden	FDI → growth	FDI ↔ growth	98.81	25150	73.67	18.95	3.26
Switzerland	FDI ↔ growth	FDI ↔ growth	156.10	33202	77.74	24.12	2.65
UK	No causality	FDI ← growth	111.89	22036	53.77	17.74	1.94
US	FDI ↔ growth	FDI ↔ growth	144.37	30733	22.31	18.95	2.61
Country	Inflows-growth relationship	Outflows-growth relationship	Inflation rate	Corporate tax revenue	Trade union density	Employment protection index	Unemployment rate
Australia	FDI → growth	FDI → growth	4.60	4.14	33.19	1.05	7.39
Austria	FDI ↔ growth	FDI ↔ growth	2.70	1.76	42.18	2.14	3.88

Canada	No causality	No causality	3.49	3.05	31.91	0.75	8.70
Denmark	FDI ↔ growth	FDI ↔ growth	3.49	2.49	75.34	1.95	6.45
Finland	FDI ↔ growth	FDI ↔ growth	3.59	2.57	73.66	2.17	8.44
France	FDI ↔ growth	FDI → growth	3.44	2.40	10.20	2.93	9.85
Germany	No causality	FDI ← growth	2.03	1.64	28.73	2.75	8.57
Ireland	FDI ↔ growth	FDI ↔ growth	4.80	2.54	43.99	0.97	10.83
Italy	No causality	No causality	5.50	3.40	38.18	2.98	9.70
Japan	FDI ← growth	No causality	1.01	4.82	23.99	1.67	3.39
Korea	FDI ← growth	FDI ← growth	5.04	2.55	12.86	2.32	3.50
Netherlands	FDI ↔ growth	FDI ↔ growth	2.44	3.32	24.69	2.50	5.98
New Zealand	FDI ↔ growth	FDI → growth	5.28	3.62	36.42	1.05	6.24
Norway	FDI ↔ growth	FDI → growth	4.13	6.42	56.30	2.77	3.80
Portugal	FDI ↔ growth	FDI ← growth	8.78	2.79	29.89	3.83	6.35
Spain	No causality	No causality	5.68	2.44	13.97	3.37	16.23
Sweden	FDI → growth	FDI ↔ growth	4.06	2.46	79.59	2.80	5.52
Switzerland	FDI ↔ growth	FDI ↔ growth	1.92	2.21	21.64	1.14	3.36
UK	No causality	FDI ← growth	4.29	3.40	36.09	0.64	7.47
US	FDI ↔ growth	FDI ↔ growth	3.50	2.39	14.89	0.21	6.05

Data source: Financial development, GDP per capita, trade openness, domestic investment, inflation rate and unemployment rate are from World Development Indicators (2011). R&D expenditure is from OECD Main Science and Technology Indicators (2010). Corporate tax and trade union density are from OECD. Stat Extracts (2011). Employment protection index is from Nickell (2006) and OECD. Stat Extracts (2011).
Note: They are period average data based on causality test period and data availability.

Appendix 9.4 Original employment protection index data in Australia from two sources		
Year	Data from Nickell (2006)	Data from OECD Stat Extracts (2011)
1981	0.3	
1982	0.3	
1983	0.3	
1984	0.3	
1985	0.3	0.94
1986	0.3	0.94
1987	0.3	0.94
1988	0.3	0.94
1989	0.3	0.94
1990	0.3	0.94
1991	0.3	0.94
1992	0.3	0.94
1993	0.3	0.94
1994	0.3	0.94
1995	0.3	0.94
1996	0.4	1.19
1997	0.4	1.19
1998	0.4	1.19
1999	0.4	1.19
2000	0.4	1.19
2001	0.4	1.19
2002	0.4	1.19
2003	0.4	1.19
2004		1.19
2005		1.19
2006		1.19
2007		1.15
2008		1.15
Note: Data from Nickell (2006) are available from 1981 to 2003 and data from OECD Stat Extracts (2011) are available from 1985 to 2008.		

Appendix 9.5 Employment protection index data in Australia used in this study	
Year	Employment protection index
1981	0.94
1982	0.94
1983	0.94
1984	0.94
1985	0.94
1986	0.94
1987	0.94
1988	0.94
1989	0.94
1990	0.94
1991	0.94
1992	0.94
1993	0.94
1994	0.94
1995	0.94
1996	1.19
1997	1.19
1998	1.19
1999	1.19
2000	1.19
2001	1.19
2002	1.19
2003	1.19
2004	1.19
2005	1.19
2006	1.19
2007	1.15
2008	1.15
Note: (1) In Appendix 9.4, we assume that the ratio of year 1984 data and year 1985 data from Nickell (2006) is equal to the ratio of year 1984 data and year 1985 data from OECD Stat Extracts (2011). Hence, the index in 1984 using OECD Stat Extracts (2011) standards is calculated as 0.94. Similarly, data from 1981 and 1983 using OECD Stat Extracts (2011) standards can be obtained in the same way. Therefore, data from Nickell (2006) in 1981-1984 period are converted into the red numbers shown in Appendix 9.5 that are compatible with data from OECD Stat Extracts (2011). (2) Employment protection index data for other countries are calculated using the same methods above.	

Appendix 9.6 Descriptive statistics					
	Sample: 20 countries (1981-2008)				
Variable	Observations	Mean	Standard deviation	Minimum	Maximum
FDI inflows	558	2.15	3.44	-15.05	26.95
Inward FDI stock (-1)	560	22.47	25.35	0	185.44
FDI outflows	558	2.62	3.49	-4.88	27.02
Outward FDI stock (-1)	553	20.77	22.46	0	148.68
Economic growth	560	2.79	2.30	-6.85	11.49
Trade openness	560	64.24	28.61	16.01	184.74
Unit labour cost	555	105.48	7.71	92.58	137.35
Exchange rate	560	99.06	25.25	56.24	208.27
Corporate tax	552	3.02	1.52	0.27	12.95
Union density	560	36.39	21.11	7.62	83.86
Employment protection index	551	1.99	1.05	0.21	4.19
Inflation rate	549	4.04	3.89	-9.63	28.78
R&D expenditure	478	1.85	0.79	0.28	4.17
Government consumption	560	19.15	4.15	9.66	29.64
Domestic investment	560	22.60	4.15	14.90	39.73

Appendix 9.7 Correlation matrix for FDI inflows equation													
	1	2	3	4	5	6	7	8	9	10	11	12	13
1 inflows	1.0000												
2 inward FDI stock (-1)	0.2360	1.0000											
3 economic growth	0.2121	0.1421	1.0000										
4 trade openness	0.3733	0.6329	0.2027	1.0000									
5 unit labour cost	-0.2971	0.0531	-0.1040	-0.0951	1.0000								
6 exchange rate	-0.1184	0.0741	-0.0484	-0.1186	0.2457	1.0000							
7 corporate tax	0.0819	0.0055	0.1426	0.0032	-0.1260	-0.1849	1.0000						
8 union density	0.0059	0.0470	-0.0738	0.2453	0.2068	0.1114	0.0180	1.0000					
9 employment protection	-0.0851	-0.2715	-0.1164	0.0010	0.1168	-0.0528	-0.0209	0.0025	1.0000				
10 inflation rate	-0.1116	0.0052	-0.1069	-0.0820	0.4315	-0.0133	-0.1801	0.1111	0.1911	1.0000			
11 R&D expenditure	0.0303	-0.2051	-0.0510	-0.1232	-0.3049	0.2954	0.1055	0.0549	-0.2708	-0.4120	1.0000		
12 government expenditure	0.0398	0.0186	-0.3431	0.2018	-0.0152	0.0449	-0.1015	0.5483	0.1934	-0.0206	0.0965	1.0000	
13 domestic investment	-0.0928	-0.1500	0.3160	-0.0829	0.1418	0.0182	0.1692	-0.2098	0.2630	0.1562	-0.0710	-0.5178	1.00000

Appendix 9.8 Correlation matrix for FDI outflows equation													
	1	2	3	4	5	6	7	8	9	10	11	12	13
1 outflows	1.0000												
2 outward FDI stock (-1)	0.5739	1.0000											
3 economic growth	0.1078	-0.0306	1.0000										
4 trade openness	0.4262	0.5253	0.2055	1.0000									
5 unit labour cost	-0.3801	-0.4003	-0.1101	-0.1573	1.0000								
6 exchange rate	-0.0721	-0.0194	-0.0471	-0.1463	0.2063	1.0000							
7 corporate tax	0.1676	0.1269	0.1435	0.0194	-0.0899	-0.1695	1.0000						
8 union density	-0.0096	-0.0324	-0.0745	0.2375	0.1829	0.1008	0.0299	1.0000					
9 employment protection	-0.0546	-0.2171	-0.1178	0.0159	0.1763	-0.0368	-0.0351	0.0157	1.0000				
10 inflation rate	-0.2116	-0.3168	-0.1151	-0.1276	0.3527	-0.0570	-0.1588	0.0811	0.2503	1.0000			
11 R&D expenditure	0.1658	0.2483	-0.0527	-0.1042	-0.2647	0.3306	0.0879	0.0739	-0.2973	-0.3909	1.0000		
12 government expenditure	0.1396	0.2338	-0.3438	0.2019	-0.0244	0.0433	-0.1004	0.5500	0.1969	-0.0309	0.1009	1.0000	
13 domestic investment	-0.0958	-0.3244	0.3183	-0.0861	0.1371	0.0167	0.1734	-0.2159	0.2698	0.1424	-0.0667	-0.5215	1.0000